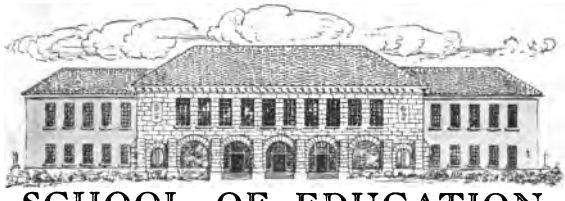

PROCEEDINGS

OF THE

TWENTY-FIRST CONVOCATION

OF THE

UNIVERSITY

OF THE

STATE OF NEW YORK,

Held July 10, 11 and 12, 1883.

ALBANY:
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APPENDIX III.

THE UNIVERSITY CONVOCATION

OF THE

STATE OF NEW YORK.

I. SKETCH OF ITS ORIGIN, OBJECTS AND PLAN.

[Reprinted from the proceedings of former year, by direction of the Convocation.]

At a meeting of the Regents of the University, held on the 9th day of January, 1863, the reports of colleges and academies, and their mutual relations, being under consideration, the following resolution was unanimously adopted:

Resolved, That it is expedient to hold annually, under the direction of this Board, a meeting of officers of colleges and academies, and that a committee be appointed to draft a programme of business for the proposed meeting, to fix the time and place, and to make such other arrangements as they may deem necessary.

The committee of arrangements on the part of the Regents were Chancellor Pruyn, Governor Seymour, Mr. Benedict, Mr. Hawley, Mr. Clinton, Mr. Perkins and Secretary Woolworth.

The meeting was held according to appointment, on the 4th and 5th days of August, 1863. Chancellor Pruyn briefly stated the objects entertained by the Regents, which were mainly "to consider the mutual relations of colleges and academies, and to promote, as largely as possible, the cause of liberal education in our State. While it is a part of the duty of the Regents of the University to visit the fourteen* literary colleges, and more than two hundred academies subject to their supervision, it is obvious that this cannot be done as frequently as desirable, and that some such method as is now pro-

*Now twenty-three (1882).

posed, whereby teachers may compare views with each other, and with the Regents, and discuss methods of instruction and general modes of procedure, is alike practicable and necessary.

"A law enacted more than three-fourths of a century ago was cited, by which the University was organized and clothed with powers similar to those held by the Universities of Cambridge and Oxford in England.

"The University of the State of New York, though generally regarded as a legal fiction, is in truth a grand reality. The numerous institutions of which it is composed are not, indeed, as in England, crowded into a single city, but are scattered, for popular convenience, over the entire State. It is hoped that the present meeting will more fully develop this fact, in accordance with which the officers of colleges and academies now convened are cordially welcomed as members of a great State University. It is also confidently expected that the deliberations now inaugurated will result in the more intimate alliance and co-operation of the various institutions holding chartered rights under the Regents of the University."

The Chancellor and Secretary of the Regents were, on motion, duly elected presiding and recording officers of the meeting. A committee, subsequently made permanent for the year and designated as the executive committee, was appointed by the Chancellor to prepare an order of proceedings. Among other recommendations of the committee, the following were submitted and unanimously adopted:

The Regents of the University of this State have called the present meeting of the officers of the colleges and academies subject to their visitation, for the purpose of mutual consultation respecting the cause of education, especially in the higher departments. It becomes a question of interest whether this convention shall assume a permanent form and meet at stated intervals, either annually, biennially or triennially. In the opinion of the committee it seems eminently desirable that the Regents and the instructors in the colleges and academies should thus meet, with reference to the attainment of the following objects:

1st. To secure a better acquaintance among those engaged in these departments of instruction, with each other and with the Regents.

2d. To secure an interchange of opinions on the best methods of instruction in both colleges and academies; and, as a consequence,

3d. To advance the standard of education throughout the State.

4th. To adopt such common rules as may seem best fitted to promote the harmonious workings of the State system of education.

5th. To consult and co-operate with the Regents in devising and executing such plans of education as the advanced state of the population may demand.

6th. To exert a direct influence upon the people and the Legislature of the State, personally and through the press, so as to secure such an appreciation of a thorough system of education, together with such pecuniary aid and legislative enactments, as will place the institutions here represented in a position worthy of the population and resources of the State.

And for the attainment of these objects, the committee recommend the adoption of the following resolutions:

Resolved, That this meeting of officers of colleges and academies be hereafter known and designated as "The University Convocation of the State of New York."

Resolved, That the members of this Convocation shall embrace

1. The members of the Board of Regents.
2. All instructors in colleges, normal schools, academies and higher departments of public schools that are subject to the visitation of the Regents, and (by amendment of 1868) the trustees of all such institutions.
3. The president, first vice-president, and the recording and corresponding secretaries of the New York State Teachers' Association.

Resolved, That the Chancellor and Secretary of the Board of Regents shall act severally as the presiding officer and permanent secretary of the Convocation.

Resolved, That the meeting of this Convocation shall be held annually, in the city of Albany, on the first Tuesday in August [see *amendment*], at 10 o'clock, A. M., unless otherwise appointed by the Board of Regents. [*Amended*, in 1873, as to the time of meeting, by making it the first Tuesday after the Fourth of July, except when the Fourth occurs on Monday, in which case it shall be the second Tuesday thereafter.]

Resolved, That at each annual Convocation the Chancellor shall announce the appointment, by the Regents, of an executive committee of seven members, who shall meet during the recess of the Convocation, at such time and place as the Regents may direct, with authority to transact business connected with its general object.

At the fourth anniversary, held August 6th, 7th and 8th, 1867, it was

Resolved, That the Regents be requested to invite the attendance of representatives of colleges of other States at future anniversaries of the Convocation.

At the fifth anniversary, held August 4th, 5th and 6th, 1868, the following resolutions were unanimously adopted:

Resolved, That there be appointed by the Chancellor, at each annual meeting, a committee of necrology, to consist of three persons.

Resolved, That it shall be the duty of each member of the Convocation to notify the chairman of the committee of necrology of the decease of members occurring in their immediate neighborhood or circle of acquaintance, as an assistance to the preparation of their report.

Resolved, That the Secretary publish, with the report of each year's proceedings, the original resolutions of 1863, as they are or may be from time to time amended, together with the two foregoing, as a means of better informing the members of the Convocation in regard to its nature and the purposes of its organization.

UNIVERSITY OF THE STATE OF NEW YORK.

AN ORDINANCE RELATIVE TO THE UNIVERSITY CONVOCATION,

Passed April 11, 1879.

The Regents of the University of the State of New York declare and ordain as follows:

SECTION 1. The University Convocation hitherto existing is hereby constituted and established as the Convocation of the University of the State of New York, and shall continue to be called and known by the style of "The University Convocation." It shall consist of such members of the Board of Regents of the University and such instructors, officers and trustees of the several colleges, academies and other seminaries subject to the visitation of the Regents and constituent members of the University, as shall at the time being attend. The purpose of the Convocation shall be to secure an interchange of opinions on the subject of education and of literature, science and art, and to advance their standard in this State; to harmonize the workings of the State system of education; and, by essays, treatises, discussions and resolutions, on subjects connected with literature, science and art and with the credit, interest and welfare of the University and the institutions composing it, to recommend to such institutions and to the Regents, for their consideration, such action as may be expedient and lawful.

§ 2. The Convocation shall meet in the city of Albany, at the Capitol, on the first Tuesday after the Fourth of July, except when the Fourth occurs on Monday, in which case it shall be the second Tuesday thereafter, or at such other time and place as may be directed by the Regents. A quorum shall consist of those present at any actual sitting of the Convocation. The Board of Regents shall always be in session during the meeting of the Convocation, with such recesses of the Regents and of the Convocation as may be expedient. The Chancellor and Vice-Chancellor and the Secretaries of the Regents shall be the Presiding officers and Secretaries of the Convocation, with power to substitute others to perform their duties respectively, *pro tempore*, not longer than one day.

§ 3. At the time of the Convocation shall be held the annual Commencement of the University, and such degrees as may be ordered by the Regents shall be then publicly announced and conferred by the Chancellor except when the Regents shall otherwise provide.

MINUTES OF THE TWENTY-FIRST CONVOCATION, HELD JULY 10–12, 1883.

ORDER OF EXERCISES.

The Convocation was called to order by Chancellor Henry R. Pierson. Prayer was offered by Warden Fairbairn of St. Stephen's College.

Chancellor Pierson delivered a brief address of welcome and congratulation. He spoke of the present anniversary as marking the attainment of the majority of the Convocation, which was instituted twenty-one years ago. So far its acquirements had been elemental and fundamental. In that period education had had, however, the advantage of the thought of men like Pruyn, and Woolworth, and Rice, and Benedict, and Hawley, and Luckey, and Tayler Lewis, and Davies, and Verplanck, and Fisher. During the past twenty years now elapsed the cost of maintaining the public schools has increased from $4,000,000 to nearly $12,000,000 a year. The character of the schools has developed in the same ratio. Meanwhile the private academies, intermediate between these public schools and the college, are in many cases becoming weak and certainly diminishing in number. The colleges, however, during this period have shown a remarkable development. In twenty years the number of professors in the colleges have increased from 125 to 352; the students from 1,300 to 3,700, and the annual graduates from 250 to 500; while the college property has, in the last ten years, grown from ten millions to nearly twenty millions of dollars. The duty of the Regents, the Chancellor said, was the perfection of methods for obtaining better education. This work has been chiefly conducted through examinations of students in the academies and those who are to enter professional life. In the preliminary examination held in June last there were 223 academies which held these examinations, and they called for and received about 28,000 different papers in the subjects of arithmetic, geography and grammar, while, in the advanced examination, the papers called for in algebra, American history, physical geography and physics, rhetoric and geometry, and other advanced subjects, amounted to over 34,000; making the total number of preliminary and advanced papers issued for a single examination to be over 60,000. When it is understood that these papers ought to be and are prepared with the utmost care upon these various subjects, and when it is considered that three times in each year new papers are to be prepared in each of these subjects, it is marvelous that so little complaint is made as to their character, and it is a matter of commendation to those who have this work in charge, that this perfection is attained. The Board, however, invites the fullest discussion upon this important part of their work. It is a matter of pride that the result of this method of ascertaining attainment has proved so acceptable, so genuine, that the law department of the State, represented by the highest court of the State, acting

with the authority conferred upon it, has established these examinations as preparatory to the study of the law, having selected certain subjects, which shall be necessary of attainment before entering the legal profession.

The Chancellor speaking of the medical colleges said:

A strong sentiment in favor of a better preliminary preparation for the practice of medicine is exhibited. We regret to say, yet feel bound to say, that no class of professional men entering upon professional life with degrees conferred upon them by authority of law, by institutions duly organized and chartered by law, are so ill-prepared in all fundamental knowledge, and in those preliminary studies which form the basis of educated men, as are those of the medical profession. Yet no profession demands so much careful judgment, such keen sagacity, such wise discretion, such prudence and skill in judgment, such maturity and broad learning as those who practice in the various departments of medicine and surgery. While, perhaps, it is not the duty of this Board to direct, it is proper that the Board should indicate to those who have charge of these institutions that they are ready to co-operate, and that they invite them to these convocations that this question may be properly discussed and such regulations may be established as will promote a better degree of scholarship in those who are about to enter and become members of this profession. As I said in the beginning, the work of the educator is never old; the needs of scholarship change with every development made in learning; it is also new to every age in which we live. The discoveries and application of science and art demand new methods in teaching. Moreover, the learning of one age is inapplicable to the wants of another, as are also the educational methods adopted by one country largely useless in another. They are useful as an auxiliary and not as independent sources of information for American youth. Thus we come again to the fact that this Convocation seeks to establish methods which are applicable to the wants of the State in which we live, and by whose benefactions we are maintained. It is gratifying to know that its work thus far has not only been commended by those to whom it has been given, but has met the expectations of the educators and members of the Board that organized this Convocation.

Professor S. G. Williams, of Cornell University, the chairman of the executive committee, presented a verbal report and laid before the Convocation the programme of exercises.

Principal Wickes, of the Watertown High School, then read the first paper of the session on civil government as a science and as a study.

The second paper was read by Principal A. C. Hill, of Cook Academy, on "Academies in their Relation to Other Schools."

An extended discussion followed the reading of this paper, which was participated in by President Waterbury, of the Albany Normal School; Principal Farr, of the Glens Falls Academy; Principal Cole, of Troy; Superintendent Cole, of Albany; Principal Cheney, of

Kingston; Principal Bradley, of Albany; Regent Fitch, of Rochester; Principal Winne, of Canastota; Professor O'Leary, of Manhattan College; Principal Joslin, of Belleville; Principal Smith, of Lansingburgh; Regent Leavenworth, of Syracuse; Principal Lovell, of Dryden; Brother Anthony, of Manhattan College; Principal Morehouse, of Port Byron; Principal Curtiss, of Sodus.

AFTERNOON SESSION.

In the absence of the Chancellor, Professor Wilson, of Cornell University, occupied the chair.

The session was opened with a discussion on the subject, "Classes in Academies for Instructing Common School Teachers."

Dr. Albert B. Watkins, inspector of teachers' classes, opened the discussion with a statement of his work, and read extracts from the reports of the school commissioners.

School Commissioner C. E. Surdam, of Port Washington, advocated the increase of the normal schools.

Principal Hill, of Havana, was opposed to teachers' classes in academies.

The discussion was continued by Commissioner L. B. Newell, of Westport; Principal Howard, of Massena; Principal Verrill, of Franklin; Principal Farr, of Glens Falls; Principal Lovell, of Dryden.

Professor J. H. Gilmore, of the University of Rochester, read a paper on "Academy Libraries." It had been prepared at the request of the Regents for the assistance of those selecting books for academy libraries.

On motion of Professor Wilson, this paper was referred for consideration and additions to a special committee. The following persons were named on this committee: Professor J. H. Gilmore, Professor W. D. Wilson, Professor D. S. Martin, Principal S. G. Love, Principal G. R. Cutting.

Rev. Dr. Wentworth, of Sandy Hill, then read a paper on the Chinese literature and language. Dr. Wentworth described from personal observation the method of conducting the examination for the Chinese literary degrees.

EVENING SESSION.

Rev. Dr. Wentworth concluded the reading of his paper on Chinese literature.

Professor W. D. Wilson, of Cornell University, then read a paper on "The Legitimate Uses of Fictions in Science."

Professor Cornelius M. O'Leary, of Manhattan College, then read a paper entitled "Evolution in the Light of Recent Researches."

This paper was discussed by Professor W. D. Wilson, Professor B. N. Martin and others.

Whereupon the Convocation was adjourned to 10 A. M. of Wednesday.

WEDNESDAY, JULY 11.

MORNING SESSION.

In the absence of the Chancellor Regent Fitch occupied the chair during a part of the morning, after which Chancellor Pierson resumed it.

Dr. B. F. Lincoln, now of Reading, Penn., but recently in the service of the New York State Board of Health, read a paper on "School and College Sanitation."

This subject was further discussed by Superintendent C. B. Tompkins, of Elmira; by Superintendent B. B. Snow, of Auburn, and by Dr. Elisha Harris, Secretary of the State Board of Health.

Principal T. J. Morgan, of the Potsdam Normal School, read a paper entitled "Some Open Questions About Normal Schools." This subject was discussed by Principal A. C. Hill, of Cook Academy; President Waterbury, of the Albany Normal School; Principal F. J. Cheney, of Kingston Free Academy; Principal J. H. Hoose, of the Cortland Normal School; Principal C. H. Verrill, of the Delaware Literary Institute; Regent St. Clair McKelway; Professor C. W. Bennett, of Syracuse University; Principal Cole, of Troy, and Principal G. F. Sawyer, of Seneca Falls Academy.

Principal G. C. Sawyer, of the Utica Free Academy, read a paper on "Regents' Examinations." The subject was discussed by Principal C. T. R. Smith, of the Lansingburgh Academy; Principal A. Flack of the Claverack Academy and Hudson River Institute; Principal D. C. Farr, of Glens Falls Academy; Principal G. H. Stillwell, of the Lisle Union School; Principal C. H. Verrill, of the Delaware Literary Institute, and Secretary Murray, of the Board of Regents.

On the motion of Principal J. E. Bradley, of the Albany High School, the subject discussed in Principal Sawyer's paper was referred to the committee appointed at the last Convocation, viz.: Professor Wilson, Professor Cooley, Principal Bradley, Principal Cutting, Principal Farr, Principal Sawyer, Principal Wight and Principal Benedict.

A notice from the librarian of the State library, Dr. H. A. Homes, was read, requesting copies of catalogues and other publications of the educational institutions to be sent to the library for permanent preservation.

AFTERNOON SESSION.

The Convocation reassembled at 3:30 o'clock, with Chancellor Pierson in the chair.

The session opened with a paper by Professor H. A. Frink, of Hamilton College, entitled "A Term's Work in English Literature."

In the absence of Professor R. S. Bosworth, of Watertown, Dr. Watkins read his paper, entitled "Order of Study in Natural Science."

The chairman of the executive committee, Professor S. G. Williams, of Cornell University, read the paper by Dr. William A. Conklin, in charge of the Central Park collections, entitled "Utility of Zoölogical Collections in Education." The subject was discussed by Professor B. N. Martin, of the University of the City of New York; Professor S. G. Williams, of Cornell University, and Secretary Murray, of the Board of Regents.

Professor LeRoy C. Cooley, of Vassar College, then presented a paper on "Apparatus Suitable for Teaching Physical and Natural Science in Academies." On motion of Professor S. G. Williams this paper was referred to a committee consisting of Dr. Noah T. Clarke, Principal T. J. Morgan, Principal E. Curtiss, Principal C. H. Verrill and Professor L. C. Cooley.

The last paper of the session was read by Principal G. W. Gillette, of Schuylerville Union School, entitled "Do Our Schools Tend to Destroy Practical Talent?" This subject was discussed by Principal L. D. Miller, of Haverling Union School; Principal A. C. Hill, of Cook Academy; Principal C. H. Verrill, of the Delaware Literary Institute; Superintendent D. Beattie, of Troy, and Chancellor Pierson.

Professor Wilson moved, and Warden Fairbairn seconded, the motion that the Chancellor appoint a committee of seven on the part of the Convocation, to co-operate with the Regents in making arrangements for the approaching celebration of the centennial anniversary of the University. The following committee was thereupon appointed: Professor W. D. Wilson, Warden R. B. Fairbairn, Professor Edward North, Professor C. M. O'Leary, President D. H. Cochrane, ex-Principal Clark and Principal Bradley.

EVENING SESSION.

Professor Albert S. Bickmore, Superintendent of the American Museum of Natural History, in New York, gave an address, illustrated by lantern views, on "Normal Instruction in Science in the American Museum of Natural History."

After which the Convocation adjourned to enjoy the hospitality of Chancellor Pierson, at his residence.

THURSDAY, JULY 12, 1883.

MORNING SESSION.

The session opened at 9:30 o'clock with Professor W. D. Wilson in the chair.

The first paper was read by Principal T. J. Backus, of the Packer Collegiate Institute, entitled "The Philosophy of the College Curriculum." The discussion of this subject was participated in by Principal T. J. Morgan, of the Potsdam Normal School; Principal L. D. Miller, of Haverling Union School; Professor C. W. Bennett, of Syracuse University; Principal G. C. Sawyer, of the Utica Free

Academy; Professor W. D. Wilson and Principal J. E. King, of the Fort Edward Collegiate Institute.

On motion of Principal Farr the paper of Principal Backus was ordered printed and distributed at once.

President R. B. Fairbairn of St. Stephen's College then read a paper on "The True Idea of a University." This subject was discussed by Professor B. N. Martin of the University of the City of New York.

Professor C. W. Bennett of Syracuse University read a paper entitled "Post-Graduate Courses and Degrees."

"Annals of Public Education in the State of New York" (continued), by Assistant Secretary D. J. Pratt of the Regents' office, was read by title, accepted and ordered printed.

Dr. D. J. Pratt presented the report of the committee on Necrology, and memorial notices were read upon Peter Cooper, Professor Charles Avery, Professor Henry Draper, Bishop Jesse T. Peck, Professor Joseph S. St. John, Principal Henry A. Pierce, Professor Thomas S. Lloyd, Principal Alonzo Crittenden, Mrs. B. N. Martin.

The Chancellor announced the appointment by the Regents of the following executive committee for the Convocation of 1884: Professor J. H. Gilmore of the University of Rochester, chairman, Professor Maurice Perkins of Union College, President Patrick F. Dealy of St. John's College, Principal T. J. Morgan of the Potsdam Normal School, Inspector A. B. Watkins of the Regents' office, Principal J. M. Cassety of the Albany Academy, Principal J. G. Wight of the Cooperstown Union School.

On the motion of Dr. N. T. Clarke, seconded by Professor B. N. Martin, the following resolution was unanimously adopted:

Resolved, That in the opinion of the members of this Convocation the educators of this State engaged in secondary or higher instruction are under great and lasting obligations to the Regents of the University of the State of New York for the great impetus they have for years back given to the educational forces of our times; and, therefore, we here in convocation assembled do, for ourselves and for the institutions we represent, most devoutly thank them for that long, arduous and truly devoted labor which has resulted in so marked improvements in our educational work, and which promises so much in the future.

CLOSING EXERCISES.

Professor Moses Coit Tyler, of Cornell University, then delivered the annual oration before the Convocation on "The Historic Beginnings of our Present American College System."

On motion of Dr. Flack, it was unanimously

Resolved, That Professor Tyler be requested to furnish a copy of his admirable paper for immediate publication in the newspapers.

The Chancellor then announced that the following degrees had been conferred by the Regents of the University:

1. The degree of Doctor of Medicine on examination under chapter 746 of the Laws of 1872:

On Milton Ambrose Wilson, Jan. 11, 1883; on Samuel Spencer Wallian; on Russel Clark Paris.

2. The honorary degree of Doctor of Medicine on the nomination of the State Homœopathic Medical Society, under chapter 366 of the Laws of 1840:

On John W. Dowling, M. D., of New York; on Reuben C. Moffat, M. D., of Brooklyn; on Lorenzo M. Kenyon, M. D., of Buffalo; on John J. Mitchell, M. D., of New York.

3. The following honorary degrees have been conferred:

The degree of Doctor of Philosophy on Professor Rodney G. Kimball, of the Brooklyn Polytechnic Institute, in consideration of his important services to education as an author and a teacher.

The degree of Doctor of Philosophy on President Edward P. Waterbury, of the Albany Normal School, in consideration of his great services as a teacher and organizer of education.

The degree of Doctor of Literature on Professor Moses Coit Tyler, in recognition of his distinguished labors in literature, especially in his great work on the History of American Literature.

REPORT OF THE EXECUTIVE COMMITTEE.

Prof. S. G. WILLIAMS, Cornell University, Chairman.

Mr. Chancellor and members of the Convocation: Unfortunately for any very systematic report from the executive committee, its work of arrangement continues up to the very moment of the meeting of the Convocation, and consequently it becomes impossible for it to put its report in writing. The executive committee wish me to report, however, that with the very efficient and, indeed, indispensable aid of the Secretary of the Board of Regents, they have had in consideration throughout the year the wants of this Convocation, and have endeavored in the preparation of the exercises to divide the work as fairly as possible amongst the three classes of schools, and also between the practical and theoretical consideration of educational questions. The practical side, indeed, is represented here by two very important papers, to which the executive committee shall call the special attention of the Convocation, and solicit their discussion. One of the papers is arranged for to-day's exercises, a paper by Prof. J. H. Gilmore, of the Rochester University. Then there will be a paper by Prof. Bickmore, a companion paper to that of Prof. Gilmore, and a continuation to the paper given by Prof. Cooley last year. These papers are intended to be distributed amongst academies and colleges, but to act not only as a guide to them in the selection of books for their libraries, and the apparatus for the work of the schools, but also as suggestions; and it seems to the executive committee a very important thing that any suggestions that can be made by the Convocation for making these lists and suggestions more complete should be given here. A subject which has not yet received the attention of the Convocation, so far as the knowledge of the chairman of the executive committee is concerned, is to be represented here to-morrow by a paper which we think will be of very great importance in schools and colleges, that is the subject of sanitation. This subject is one of the very greatest importance; it is one to which our attention has been sometimes distressingly called by outbreaks of diseases in some of the educational institutions, in colleges, academies and schools, and it is well that it should be treated here and should be thoroughly discussed. We think the subject will be presented by those who have earned by very long consideration of the subject the title to be considered authorities. The paper also that will be given by Prof. Bickmore, on training science teachers, will be illustrated by stereopticon illustrations, it will be of very great importance and will present to the teachers from all parts of the State a scheme adopted with great success in New York city during the past year. One of the papers that will be presented to this Convocation, at least in our sister States, has raised a very great amount of discussion, and has undoubtedly done a considerable amount of good in calling the attention of teachers most thoroughly to the basis of this system, and to the

tendencies that might be legitimately expected to grow out from them. There has been but a small amount of change from the program originally arranged by the executive committee, and which it has been hoped we should be able to follow for the three days. The two papers put on for to-day have not been changed. The paper on Pedagogy, by Principal Morgan, of the Potsdam Normal School, has been changed for Wednesday morning. The paper by Prof. Frink, on a Term's Work in English Literature, has also been deferred until to-morrow. The paper on Chinese Literature, by Dr. Wentworth, set down for to-morrow, will be read this afternoon. Prof. Wilson, of Cornell University, has changed the subject of his paper, and will take as his theme "The Use of Fictions in Science," instead of "The Recent Origin of Man."

CIVIL GOVERNMENT AS A SCIENCE AND A STUDY.

By W. K. WICKES, Principal of Watertown High School.

Two considerations tried to make arduous the task before me: FIRST, the difficulty in constructing an interesting argument on the *science* of government — since on its essential principles all right-minded men are agreed. SECOND, the difficulty in securing earnest attention to the *study* of government — since the practical importance of that study is so unhesitatingly conceded. And agreement is apathy.

This agreement to which I have alluded arises from the fact that some of the truths which men hold about government are *instinctive* truths; they do not belong to the realm of reason and logic — they are intuitive and axiomatic. "We hold these truths to be self-evident," says the Declaration of Independence. *That* estops all argument. Who cares to, or indeed can, unless he be a philosopher, argue about an intuition?

But all truths of government are not thus instinctive. The range is wide of what I may call *intelligent* truth; that is, of truths founded in reason and experience; and if the State is to be saved, it will be, I believe, through the wise operation of these intelligent truths, rather than through the blind and fitful fury of such intuitive truths as liberty, equality and fraternity, which once and again have made the streets of Paris run red with blood!

Permit me, then, to call your attention, briefly, to some truths of the science of government which, though they may have in them an instinctive element, are yet cognizable by, and conformable to both reason and experience — in short, are intelligent truths.

FIRST. *The Genesis of Government is from God.* The voice of Revelation is not uncertain here. The proclamation of God's sovereignty in human affairs is repeatedly sounded forth. But sovereignty over what? Over man, his creature? Yes. By means of a plan which, in its elements and principles, that creature devised? Ah, no. If God indeed rules, most surely all the attributes of sovereignty are in, and emanate from Him. The same Being who thundered forth from Sinai his sovereignty in the words: "I am the Lord, thy God," also proclaimed his law in "Thou shalt," and "Thou shalt not." The voice of Reason, also, proclaims that government is from God. That way tends the right thinking of the world. Government, in its genesis, is a cause — History, an effect. Who will point out an event in all the recorded history of mankind which had not its cause in the idea of government? But whence came this cause? It antedates history, and therefore is not of Man. It is of God. "Government," in its *form*, is, as has been said, "a contrivance of human wisdom to meet human wants;" but, in its *essence*, it is divine. The *seed* is God's own implantation.

SECOND. *The Germs of Government are in History.* Hardly falls the seed of government into the soil of this world before it begins

to germinate in history. The family is formed, God's representative idea of government, and forthwith, History appears. . At first, the records of the quiet daily life are hardly worth recital, and the whole audience may sit by the fireside. Soon, there appear the germs of a clan or tribal history; but curiously enough, and quite in accord with the order we have before mentioned, not until there has come some idea of tribal government. It will not be long now before some rude kind of a national or race government will be established and the field of history be correspondingly enlarged. At, or even before this time, some Homer, like a bird of early twilight, will begin to sing of the deeds of demigods, and perchance of gods. Soon, bards, minnesingers, skalds, will recite the prowess of heroes. When civilized government is established, history will furnish more and more, and so, from that divine implantation of government in the mind of man, spring the ever-increasing germs of history.

THIRD. *The Growth of Government is of Men.* This comes about from the constraint which there is upon men in this world to *think* and to *act*. At first, in rude ages of the world, the spirit of action is widely predominant, and the real growth of government is slow. Indeed, at such a time, a certain kind of history, not very valuable, flourishes much better than do the practical principles of government; and much of that history finds record of some kind for itself. But truly says Stopford Brooke, "When the thinking spirit succeeds the active and adventurous in a people, the first thing they will think upon is the true method and grounds of government both divine and human." *Then*, we may well believe, there will be a constant, though not always equable growth in good government. "See, my son, with how little wisdom the world is governed," said the Bishop of Oxenstern, when on his death-bed. There is force and truth enough yet in the remark, but I believe it is not so greatly true as when the bishop uttered it. The science of government *does* grow, in clearness, force and practical adaptation to the needs of men.

FOURTH. *The Glory of Government is in Morality.* This is a truth theoretically admitted by all men, and yet very often practically forgotten. The politician who in a burst of patriotic fervor sings:

> "Our father's God, to Thee
> Author of liberty,
> To Thee we sing"—

admits it. But when he "contaminates his fingers with base bribes," and puts his manhood in pawn for power, he really denies it. And yet, no denial will avail to change the fact. Every school boy knows the road to ruin which Rome took as soon as she forsook morality. Nor are there lacking shrewd observers who say that the flourishing civilizations of our own day will ere long go the same way, unless that spirit of luxury and greed for gain, which are beginning to be so manifest, are in some way checked.

Now, if it be true that the genesis of government is from God,

its germs in history, its growth of men, its glory in morality, I am prepared to define government as *God in history, working out through men his perfect moral plan;* while government, as a science, would be the facts of history and the deeds of men, out of which are brought to light great moral principles for the world's guidance. Go then and tell the politician — this science of yours is not first *political* but *moral;* say, also, to the doctrinaire, puzzling his brains in vain to find out some plan for shutting out God from all concern in the affairs of men — government is not a "social compact," it is a moral trust.

Turning now to our own country, we find the *genesis* of our republican *form* of government to be in that providence of God which first led our fathers to leave the soil of old England. For, says Goldwin Smith, "the revolution was the vindication, not the commencement of national existence. Washington was the preserver of the Commonwealth, but Cromwell, as the chief of puritan statesmen, might with more reason be regarded as its founder."

Again, the *germs* of our present form of government are found in the events of our revolutionary history. That war made it clear, that the political temple to be reared on this side of the sea would have no throne erected within its walls. A recent English writer says, that "the United States could not have become monarchical, even if the constitutional convention had decreed it; even if the component States had ratified it," and then goes on to intimate that "the mystic reverence, the religious allegiance," of monarchists would be lacking. One would think they might after the experience of the colonists!

Again, the *growth* of our form of government is due to the deeds of brave men, and wise as well, who met each other in a spirit of concession when they would establish a "more perfect union," and were as one in their desire to construct that form whose strength and beneficence we know to-day.

Again, the *glory* of our form of government is, and must ever be in its political morality — that is, in the enthronement and enforcement of those principles which are eternally right and true. Hence in what a new moral light and beauty did our government appear before the world when slavery was abolished and that equality which the Declaration of Independence had stated was at length secured.

The second part of my subject relates to the *study* of Civil Government.

How much time ought to be devoted to it in our schools? I remember when I was a student in college that the senior class listened to twelve lectures by Prof. Dwight, of Columbia Law School, on Constitutional Law. That was the sum total of our instruction in civil government, or in any subject akin to it. The colleges, most of them, at least, do better now, though still failing to realize fully the importance of the study or the ardent desire of young men for instruction therein. As proof of that desire, I may

cite the fact that in a certain college where civil government was offered to the senior class as an optional, every member of the class made choice of it. But I am chiefly concerned now with academic instruction. I do not see how any thing worthy mention can be accomplished by less than a term's study, with daily recitations; and when I think of two things — first, how vast, and second, how important the subject, I know and feel that I have made by far too moderate an estimate. Many a young man never thinks of geology after he leaves the High School, or looks at Greek after he has finished his college course — while the great facts and principles of government meet him at every turn in life. I can only say, then, let the time devoted to that study bear something like a true ratio to its practical importance.

I pass now to a brief consideration of some of the things needful to the scholar for an intelligent study of government.

First — Information: And by this term I here mean, chiefly, such historical knowledge as is necessary, yes, absolutely indispensable to any true conception of that which is to be studied. Apply this statement to the Constitution of the United States. It would be impossible for a scholar to understand even the preamble of that instrument without go-before knowledge of the facts which made imperative a "more perfect union;" or, comprehend at all the articles of confederation without allusion to the doleful condition of the colonists; or see the slightest significance in the Declaration of Independence without the story of the scarlet soldiers who swarmed over the seas to obey the behest of that bigoted and purblind king who a hundred years ago sat on the English throne. Mark, I am not now pleading for that deep and wide knowledge of history which reveals the true spirit and intent of facts, but simply for that information which will serve to show that certain facts had something to do with constitution and confederation and independence. The English boy has no written constitution to which he can point as the philosophical result of facts — the American boy has; yet ashamed indeed would the English boy feel, to be so ignorant of fundamental, historical facts as the American boy is too often permitted to be by his elders.

Second — Explanation: The question is often mooted whether government is simple or complex in its character, and wide is the divergence of expressed opinion on that question. The fact seems to be, that those who rely upon their instinct for their knowledge, call it simple; while those who tax their intellect with its problems find them well nigh insolubly complex. Of this, at least, the teacher may certainly be assured, that there are certain principles and expressions which he must take great pains clearly to explain, or the rest of his teaching, be it never so faithful, will go for naught. Take, for instance, that grand triune principle of the legislative, judicial and executive departments of government. It will not do for him to take it for granted that any thing so clear, so well defined as that will explain *itself;* for the

truth is, that in that three-fold phrase lies wrapped up that mighty principle of division of power in government which perplexed the fathers and how often proves a source of trouble to the sons. Let the illustration I have just given suffice as regards the principles of government and look at an expression or two of the Constitution. What would an ordinary, or even an extraordinary pupil think as to the nature and need of an *ex post facto* law? Or how construe "a bill of attainder"? While "corruption of blood" would certainly defy all the psychology and philosophy and physiology he could bring to bear upon it. Nor think that I am insinuating unnatural ignorance on the part of scholars. We often give them credit in our thoughts for better comprehension of a subject than they really possess; just as they sometimes credit us with greater profundity than belongs to us. Let us hold with Justice Story that the study of government ought to be made as simple as possible, and then make it so by explanations as clear as we can make them.

Third — Illustration: I reach now a most important and, as I trust, interesting part of my theme. I hardly know of a subject which better lends itself to the purposes and processes of illustration than the subject we are now considering. And first, though by no means most important, I would endeavor to illustrate *pictorially*, and by that I mean through the medium of any material object. Almost any place of size will furnish some relics of by-gone time. Hold these — a book, picture, Continental uniform, firelock, Revolutionary scrip — before the class and tell the story which it teaches. This must be done with dignity and enthusiasm, indeed, or better not done at all. But, rightly done, it may lead the scholar to better appreciation of a principle beneath the fact.

There is another source of illustration of which I am persuaded teachers of government make too little account; that is, *the history of foreign nations*. What significance there is in the fact that twenty years before the Revolution, England and the colonies fought as one against a common enemy, France, while *in* the Revolution, France and the colonies fought side by side and the common enemy was England. What did it mean that Hessians left fatherland at the command of some German prince and came to this land to pillage and kill? Where was the thought, what the constraining argument that led to so strange an event? And, above all, what was the temper of England before and at the Revolution, as judged by the words and acts of her great parliamentary leaders? The teacher can point his scholars to no better illustration of the radical injustice of the cause which George the Third championed than that which is found in the lofty and impassioned utterances of Chatham and Burke. They were Englishmen and could never forget that England was their country, yet how grandly they stood forth as the friends of America and the advocates of her rights; and though they could not stop the war, they were, even before that war began, the conscious heralds of the peace and freedom about to be. The com-

plete story of what Englishmen did to save England from disaster and loss has never yet been told. But, meanwhile, the thoughtful teacher can draw many a useful illustration from this foreign source. Let him only take care not to obscure or veil the meaning of the historical fact which he proclaims.

A third source of illustration may be found in talk about *famous localities*. This will tend to give vividness and reality to many of the principles which might otherwise remain lifeless and unreal in the mind. And the explanation of this is very easy, even if not very complimentary to our thinking. We always are prone to fasten our thought to some material object. And this is especially true of the young scholar, in whom the elements of imagination are so omnipotent and strong. So, in our recent history, the educational influence of Independence Hall, in Philadelphia, can hardly be over-estimated. The very word "independence" has had a new sound to many a boy and girl since they looked upon the old bell that once proclaimed it. Saratoga's chief value is not resident in its charms as a summer resort, but in the memories it awakens of the days when men were contending in a life and death struggle for a principle. Greater than the beauty of the poet's *words* in that *spot*

> "Where once the embattled farmers stood,
> And fired the shot heard round the world."

But I need not multiply instances to prove this present point. I will only add here, that I think teachers do not pay sufficient heed to this simple help to teaching. If we can give to any of the underlying principles of our government, as the poet does to his fancies, "a local habitation," we have made more lasting our work, and may, perhaps, safely expect that so long as the knowledge of the place shall last the memory of the deed will not wholly fade from the mind.

Still another plan which I have found to work well in my personal experience is to require from scholars of the class a clear and concise *history of the colonies*. More than one point is gained by such requirement. Not only is information, oftentimes of great historical value, gained, but various ideas of government are brought to light. For while it is true that all the colonies had, in the main, the same kind of government, there yet were curious differences among them. And this fact raises at once the question, as you see, *why* these differences? Were they innate or inherent, or merely circumstantial? Did they help toward or hinder union? Did they tend toward monarchism or republicanism? Still another value of this exercise is found in the different ideas shown by scholars as to what constitutes the best government—either relatively to circumstances or absolutely. In fact, there is hardly any limit, save that of time, to the questions which such historical studies may suggest. Even so little a colony as Rhode Island, least of all, and last to give in its adherence to the new Constitution, furnishes abundant material for reflection. If now, in addition to what I have intimated on this point, the teacher can get the individual scholar to think that the col-

ony assigned to him is *his own* colony, he will sometimes exhibit a spirit of patient research which will not only be of great service to the boy, but will delight his teacher's heart as well. Not that I mean to say that pleasure afforded the teacher is the main thing; although it is the necessary sequence, in case of every true teacher, to the success of the scholar in his work.

Again, in the hope of exciting interest and giving greater life and glow to the study of government, I would assign to the different members of the class the writing of *brief sketches of the various signers of the Declaration and the Constitution.* The philosophy of this requirement is apparent at a glance. It serves to interest scholars in that which has profounder significance in this world than any thing else — human life; awakening deeper interest than any mere abstract principle, however beautiful, can do — for human life is principle vitalized. True, the lives of all the signers are not equally interesting, and yet there is scarcely a man among them all whose life, often scantily sketched in history, does not reveal some characteristic traits, useful to explain, or powerful as incentives. As an illustration take Robert Morris, assign his life to a bright scholar, showing him where the materials exist out of which he may construct his story, and what a revelation that life will prove of the principle of patriotism incarnated! Even the dullest scholar then could not fail to see how that mighty man bore on his shoulders the financial burden of the Revolution, planning, hoping, sacrificing. Alas, that the scholar could also not fail to see the same man powerless, spirit broken, penniless; not proving necessarily the ingratitude of republics, but at least showing how the sympathy which every good man needs and craves is grudgingly given or utterly withheld. Time would fail me properly to speak of Franklin carrying the war into England, and with more than Scipio shrewdness fighting there the battle of American freedom; of Hamilton, resting not day nor night till the Constitution was ratified; of Washington, in whose life the new republic saw incarnated the morality which was the glory of its own youthful life.

Again the skillful teacher, if duly enthusiastic, will find very serviceable *the narration of remarkable incidents.* Such a one was that where, after the Revolution, the army, not yet disbanded, lay encamped at Newburgh. The soldiers had not yet received their pay — it was doubtful whether they ever would; there was imminent danger of revolt, and fratricidal blood might at any moment be spilt. Designing men, some of them high in rank, were secretly instigating trouble, and a call for a meeting for the discussion of grievances was issued. When finally a meeting was held Washington was present. As he rose to speak men felt indeed that he was the arbiter. He pictured the strife through which the army had passed in the Revolution, and begged his hearers by no dark act to sully the brightness of their heroic deeds. "I have grown gray in your service, and now find myself growing blind," he pathetically cried. Instantly the spirit of discord ceased, and the army, with a

patriotism no less admirable than that which had marked it on many a battle field, awaited the tardy recognition of its rights. Now what teacher cannot see that the proper recital of such an incident in presence of his class must help to better appreciation of the real work he is striving to do? Then let him reflect that American history teems with such illustrative examples. I commend to him the experiment.

I commend also another plan, namely: to dwell intently on what may be termed *pivotal events*. For such events are not simply and solely facts, they are rather the seals of many facts, as attestations of great principles. Such an event, as I view it, was Bacon's rebellion in Virginia, one hundred years before the declaration of independence. It was a revolt against subserviency, a notice of resistance served on tyranny. It was, if I may so speak, a suit, entered in a colonial court, carried at length after more than the proverbial "law's delays" to a Confederate court, and finally to that Supreme Court of the Union which irreversibly decided that Freedom had made out its case. Another pivotal event was the Stamp Act. We are apt, I know, in thinking of the immediate and unflinching resistance which our fathers made to this measure, to forget the series of facts which led up to, and made possible its issuance, and hence the greater necessity here for a careful study. The chief value, however, of the plan I am now advising, seems to me to be in the fact that it gives opportunity for *logical* study, the tracing of isolated facts to their logical results in pivotal events. And when I think how sadly neglected in the schools of our day and land is the fine old study of logic, I must urge any plan which looks toward the pursuit of that study. Nor need it be said that the facts of history seem at times strangely illogical. So seems every new planet that sweeps before the bewildered gaze of men, but surely a law controls it. No less is true of the individual facts of history.

I come now to a kind of illustrative teaching of highest importance and interest, and practically exhaustless in its scope; *the interpretation of current events*. What constant illustration of the principles of the Constitution, for instance, is found along the line of the march of daily events. This implies, to be sure, daily reading of the daily newspaper; and in that very requirement is found an element of untold value in the education of every American boy and girl. It has been my custom, whenever time would permit, to devote a whole term to the examination of the Constitution alone; nor do I deem the time disproportionately great, for I find so many illustrations to my purpose in current events that less time will not suffice; and moreover, I cannot conceive of any study more profitable than that which, taking a body of principles themselves, the philosophy of past facts, proves them anew and indisputably by present facts. It would be needless, even if it were possible, to give all the illustrations which arise in the mind upon this point. But suffer one or two to make my meaning clear. We read in the papers that a notorious New York criminal escaping to New Jersey has been

returned to the former State on the requisition of its Governor. Why upon requisition? If a criminal here, why not there? And if a criminal there, why not simply send and take him? And why should the New Jersey Constitution prescribe the process of remanding when the offense was against the peace of the Commonwealth of New York? What, also, shall be done with an ex-Governor of Massachusetts, who about a year ago refused to honor the requisition of South Carolina's Governor? Again, I see by the paper this morning (July 9), that President Arthur is anticipating a trip to the west. Who will rule in his absence? Who, in the event of his death, or capture by the Apaches? Again, the so-called "trade-dollar" has been refused at its face value by the merchants of the city of New York. Now, Congress, according to the Constitution, has power to coin money, and in accordance with that authority it coined that dollar, thereby legalizing it. Did it use its undeniable power unconstitutionally? If so, what power shall declare that fact? If not, what right have the men of New York to refuse the coin of the country? What hinders the government from sending out a *posse comitatus?* A *what?* What *is* a *posse comitatus?* Again, I know that the Constitution guarantees to every State in the Union a republican form of government. Well, I read some morning that an insurrection has broken out in a certain State, and that anarchy is feared. In this emergency the Governor telegraphs to the President for aid in quelling the disturbance. But does a republican form of government still exist despite the threatening look of matters? And if it does, can the President interfere? And, indeed, exactly what *is* a republican form of government? Where is the definition of it? I need only add on the point I am now illustrating that the teacher who reads carefully the daily history of the world will not fail to note many points in the current history of *foreign* nations, also which will furnish him with apt material for his work. I well remember an interesting argument in the class room, on the legal responsibility of several Americans, who, after counterfeiting Brazilian coin, fled to this country and were arrested and tried under United States authority. Is there a law in this country against the act of those men? No; but was the act in its nature criminal? Yes; yet did they go free? Yes, why?

I have time merely to mention several supplementary helps, the value of which I have personally tested and heartily believe in, though I make no special recommendation of them to the teachers.

First — The debating society. Meeting the boys of the two upper classes one evening in every two weeks I have endeavored to secure the discussion of as many governmental questions as possible. And I remember a debate just before the last presidential election, where after the disputants had talked for four hours, I was obliged to resort to the previous question to stop further debate.

Second — A United States Congress. This proved very enjoyable and profitable, every member serving out his full term. Each member was at liberty to introduce bills, to discuss, to amend — in short

to do every thing which the great prototype Congress could parliamentarily do, except in the Senate, where the previous question was put in force as indispensably necessary. I organized also a State government and through the kindness of the Hon. Chas. Skinner, then member of Assembly, now representative at Washington, we were supplied with copies of the bills brought before the Legislature. And I can bear witness for the boys, that no bill with the faintest *aroma* of a job about it stood any chance of passing!

Third — Celebrations. As for instance, of Washington's birthday when scholars recited a programme consisting wholly of literature contemporaneous with Washington or relating to contemporaneous events.

Fourth — Books. There are many excellent works now on government; to these I point my scholars and bid them read and think.

In conclusion, almost every week as it goes by witnesses (or passes unwitnessed by) the one hundredth anniversary of some great event in the founding of our government. The present time, therefore, is so opportune for the study of government, that I ask to drop for a minute the didactic and teacher tone so common in papers here, and simply as an American citizen and patriot—enthusiast if you please —plead for due recognition of that delightful study. I would fain see every child of the present generation love his country intelligently, not alone instinctively. The peace that "hath its victories" can only come from education and enlightenment; the wars that cost so many lives and so much treasure often spring from ignorance inflamed. By so much then as we love peace and hate war, let us teach the principles of citizenship. And when a year hence the centennial history of this University shall be given, let it not be forgotten that civic glory and strength made a noble educational system not only possible but real.

ACADEMIES AND SECONDARY EDUCATION.

By A. C. HILL, Principal of Cook Academy.

The term "academy" has become so ambiguous among us as to need for our present purpose some definition. In the popular sense, schools doing the work intermediate between the common school and college are academies. In this view the term applies to high schools, academic departments of union schools, and to normal schools, as well as to the old-time academy. In this discussion, however, we wish to restrict the term to voluntary schools, or those receiving little or no financial aid from the State. Academies in this sense are few, and are capable of subdivision into private schools, or those managed as money-making institutions, and endowed schools, or those founded and sustained in part by the benevolence of individuals. It is strictly to the latter of these that we shall refer in speaking of academies.

At the State Teachers' Association at Lake George we were told that the *academy* is a thing of the past which did good work in its day, but which has served its purpose, and must now give place to something better. It was also asserted that great progress in public instruction has resulted from the establishment of the union and high schools. The truth of both these statements we most emphatically deny. The condition of the district schools of the State seems to us even more deplorable than it was twenty years ago, and the secondary education furnished by the State is greatly inferior to that given by the old-time academy. The great progress in public education that we have held up to us is largely the creation of the fancy, stimulated by self-interest, and has no existence in fact. The State is attempting to do too much and is doing nothing well. We are surprised to find among educators so few warm friends of the academy, and very much regret to feel that we stand so nearly alone to champion the cause of the school which has perhaps done more for higher education than all other schools combined. The endowed academy, independent of politics, free from the restraints of penurious tax payers, though now crushed to earth by the ill-advised policy of the State that ought to foster its growth, like truth will rise again and resume its position and prestige as the real public school of a republic.

We wish at the outset to disclaim all prejudice in favor of any particular kind of school. Education is of such paramount importance, so intimately connected with individual character, and the welfare of the nation as to make it almost criminal to be influenced in considering it by personal interests. Education, like religion, is too sacred a theme for the charlatan or mere politician. It is with a most earnest desire to have truth prevail, and to subserve the highest interests of education as the great civilizer, the bulwark of our liberties, that we present to this body the educational problem from the standpoint of those who are laboring to maintain academies

Our educational system, like our government, has been experimental and political. Majorities rather than the best sense of the wisest men have determined its character. The people desire popular education, and in their zeal for it often become the tools of designing demagogues. The radical defect of our system of public education is the entire absence of any recognized limit to the functions of the State. We are sailing without chart or compass. The State can go as far as it chooses in providing for education, and the wily politician — for politicians are to be found among educators —. can secure such legislation as he chooses from such men as make our laws. It ought to be remembered that not all legislation granting State aid to education is conducive to the desired end. Private benevolence is ready to do something for education, but it does not desire to enter into competition with the State in doing any grade of educational work, and its effects are now paralyzed by the uncertainty as to what is to be left for it to do. It seems to me fundamental that there can be no rivalry between public and private schools when they are each doing their legitimate work. There is at present such rivalry, and it follows that either the State or private effort is at fault. What relation does the academy, as we have defined it, sustain to our educational system? What is its specific work? It must have a distinct and recognized place or else no place at all. It cannot continue as a competitor with State schools. Is it to do the secondary educational work or is it not? These are questions which the friends of academies wish to have answered, and no questions more important to the progress of education will be asked or considered at this meeting.

The State has by degrees assumed all grades of educational work. It provides not only for elementary education as in the common school, but for secondary education as in normal schools and the academic departments of union schools, and for collegiate and technical education as in Cornell University. Now if all this work belongs by right to the State, there is no work for private benevolence to do too. If the State has the right to found and sustain one school of higher learning, it has the same right to establish others, and thus assume the entire work of educating its citizens. If, for example, a part of our youth are to be educated at Cornell University, at public expense, why should not all have equal privileges? If certain communities are to have State academies under the name of normal schools, why should not every community be equally favored? If the State is to embark in the work of higher education at all, and to take a stand as a rival of private enterprise it must be prepared for the logical result that it may and doubtless will eventually have all the educational work to do. The injustice of this state of things to which we are tending is too apparent to need consideration, and yet the indications are that the State will go still farther in granting aid to education. The prospects are to us alarming, and we are led to ask the question, has the State the right to promote higher education? After examining the subject from all sides we are ready to

answer emphatically, *No.* The course of reasoning by which this conclusion is reached is doubtless familiar to all, though it is practically lost sight of in educational discussions. The following are self-evident propositions: 1st. That the State can justly assume to educate its citizens only on the ground of its necessity to fit them in the *minimum* of qualification for citizenship. 2d. That only that degree of education should be provided which is available to the masses and which can be made and is made compulsory. Academic and college training, however desirable, are not essential, as a police measure for self-preservation not available to the masses, not to be made compulsory, hence do not come justly within the province of the State.

The injustice to individuals, following the assumption of the functions of education by the State, is seen in many ways. It is unjust to tax a man to provide what he does not wish or what he has not time to procure. We wish, however, to point out the injustice of State education in a matter that is seldom considered. We refer to the religious aspect of education. Religious questions cannot be kept out of higher education; indeed religious culture forms a part of higher education. A boy cannot go far in higher studies before he comes face to face with the question of a God. It is at this critical time that the teacher is most potent in leading him to accept or reject Christianity. We are told that schools sustained by the State shall be so administered as to do no injustice to the religious convictions, or lack of convictions, of any citizen; in other words, that religious teaching shall have no place in the public schools. As a matter of fact, the question of religious culture is practically ignored in our public schools, and professed atheists are to be found in them and even in our normal schools. There has ever been a strong tendency to secularize public instruction, and we have departed a long way from the early condition of education when it was in the hands of the church, and with very marked and alarming results upon the morals of the young. Now, when the evils of laxity in this direction are beginning to be felt, the call for moral instruction in the public schools is heard, and it is proposed to teach morality from text-books. When this experiment has failed, as it surely will fail, it will be learned that the principles of Christianity can be taught only by living examples, that machine morality is impossible, and that there is an intimate relation between education on the one hand and morality and religion on the other, and, for this reason, there can no more be a union of school and State than of church and State. It has been assumed by enemies of religion, and too easily granted by its friends, that justice demands that no religious instruction be recognized in the public schools. I beg to ask if my neighbor, who is an atheist, has any more right to demand that the Bible be excluded from the public schools than I, who am equally a tax payer, to demand that it have a recognized place there? Will it be a greater injustice to him to have a religious test applied to teachers than to me to have such

test neglected? It seems to us that the rights in the two cases are equal, that I should no more be compelled to support a school to teach the negation of God than my neighbor one to teach the existence of a God. It seems to us that the true republican principle is to leave higher education, which is so closely connected with the development of character, to philanthropy. Then the infidel may found schools to propagate his code of morality, and the Christian will also be free to inculcate truth as he views it. Certain it is that I, who am convinced that Christian culture must go hand in hand with mental culture, will not send my boy to a State school where Christianity is ignored or where infidelity may be openly taught. Should I then be compelled to pay taxes to sustain such schools?

With this consideration of the general relation of the State to education, we turn to the more specific question of the relation of the academy to our system of education. Here the effects of the State policy are most keenly felt, and, one by one, the old-time academies are disappearing or sinking into comparative worthlessness for lack of support. The rivalry with State schools is proving too much for them, and their future is causing much anxiety to their advocates. We quote at this point from an editorial in the Utica *Herald*. It says: "Since the State embarked in the normal school business the number and attendance of the private academies, which were once the glory of the educational system of the Empire State, have steadily declined. It is well within the memory of persons still living, when Central New York was the center of this prosperous and beneficial system of academies. When we fully understand the cause of the decline of these institutions, we realize that it must prove a permanent decline and that it is due to no inherent weakness, or deficiency in the system of education upon which these academic institutions are founded. The State of New York is annually paying out for the support of rival schools of learning more than $150,000. It is supplying buildings, apparatus, libraries. It is beguiling to the normal schools the pupils who formerly flocked to the academies, by offering free tuition, as well as paying a portion of their traveling expenses. Nominally the normal schools are intended chiefly for the education of teachers for the common schools of the State. Practically they are absorbing our academic education, except as it is supplied by the academic institutions of the public school system of our larger towns. These latter being also free, give instruction to a large number of pupils of the class which formerly relied upon the private academies. Between the two the private academy encounters a competition which is too much for it. The State normal system we have always regarded as meretricious and we have deplored the consequences of its introduction — one of the least of which is the disastrous effects upon our private academies. But it is a system well-established, well-fortified and likely to be continued as a part of our public school system of the State." This extract, taken from an impartial source,

indicates something of public sentiment on the subject. The same article advises the acceptance of the inevitable, and proposes that another normal school be established on the ruins of Whitestone Seminary, once one of the most prosperous academies in the State. We have in mind an academy founded by the self-sacrifice of individuals, and endowed by private benevolence, a school well prepared to do excellent work, yet which is languishing for lack of pupils, who prefer to go where "tuition and traveling expenses are paid by the State." Several of our colleges rely upon normal schools as their principal feeders. Academies, except such as are sustained by those who are convinced of their necessity to the maintenance of Christian culture, will eventually, if the present policy be continued, be forced to abandon the unequal struggle for existence. This result we cannot believe was anticipated when State schools were established, nor do we think it was desired. We very much doubt whether the best public sentiment of to-day favors the continuance of the present policy. But the question of higher education has been thrown into politics, and there are personal interests that are obstacles to reform, for justice and right are too often interpreted in the light of self-interest. Yet the remedy is not beyond reach. The pristine vigor and efficiency of the old-time academy may be restored. The same power that set the mischief at work can remove it. If the State has assumed functions that do not belong to it they should be abandoned when the evil effects are seen. Let the limit to public instruction be definitely fixed and rigidly adhered to. Let this amount be the *minimum* requisite to secure the nation from the evils of ignorance. Let normal schools be confined more strictly to the work for which they were intended. Let the first step be to exclude Latin and Greek from all schools supported by taxation. This single step would do much to restore the academy to its former position and influence and would raise the standard of education throughout the State. For our colleges can never attain to the high standard desirable without the existence of amply endowed academies. Education in New York does not take the rank that the influence of the State deserves, and the most potent cause as we believe is the neglect of academies consequent upon the assumption of higher education by the State. As we said at the beginning, we do not plead for the academy from personal motives. If its decline meant no more than a lessening of the number of schools in the State, it need cause no regret. But it does mean vastly more. A vital principle is at stake, and it will be a sad day for education, for morality, for republican government, and above all, for Christianity, when the higher education passes into the hands of the State. God forbid that a day shall ever dawn when the rum-sellers, the Barney Biglins of New York, and the "bosses" from Albany to Buffalo shall have it in their power to say what shall be the education of the rising generation, or who shall be its schoolmasters. A misdirected education is a thousand times worse than ignorance. Nihilism and socialism were bred in the schools of Russia and Germany. Tell us what

schoolmaster is abroad and we will tell you the character of the people.

There are problems yet unsolved regarding elementary instruction to occupy the attention of legislators. If the lower branches were well taught in the public schools and the education provided made compulsory the ends provided by government in establishing free schools would be better met than now, and higher education might be safely left to voluntary schools. The State is aiming too high, and wasting its ammunition. The teachers it educates for the schools do not enter the schools. To devise a way to secure adequate compensation to teachers would do more to fill the schools with competent instructors than all the agencies now employed are doing.

The University of the State of New York, as represented by the Board of Regents, is the conservator of higher education among us. To this body the friends of higher culture are justly looking to defend academies from the noisy iconoclasts that just now profess to represent public sentiment. The advocates of the "bread-and-butter" theory of education, who use the term "practical" so fluently, yet know so little of its real significance, need at once to be checked. They have pushed their utilitarian views to an extreme that threatens the existence of high culture, and is rapidly exalting matter over mind, reputation over character, and is substituting for high ideals, the vulgar degrading notion that to satisfy human appetite is the chief end of man. Let such a protest against all this be made by this body that it shall be heard from Maine to California — and heeded.

President WATERBURY, of Albany — Mr. Chancellor, I wish to say a few words in regard to this paper in connection with the Albany Normal School. The Albany Normal School, sir, may be called the second normal school in the United States. It has, ever since its establishment, devoted itself assiduously to the work for which it was created — to training teachers for public schools of the State. I think it is fair to say that it has not in this respect come particularly into competition with the academies of the State. There have gone from it over twenty-six hundred graduates, and as I am now employed in collating a historical catalogue of the school, with the history of the work of these graduates, I think not more than one in two or three hundred have not taught as they were expected to teach. They have been faithful in this work. In addition to this, and beyond the graduates, the school has given partial training to about nine thousand other teachers of the district schools of the State. The training in this school does not include any languages — either classical or modern languages; it devotes itself entirely to its proper work, and I think it may be said that that school, through its direct and indirect influence, has changed the whole face of public education in the State of New York. I think from my researches I will go further and say it has done the same thing for the State of New Jersey. And then look toward the west; it has created public

schools in great measure in the States of Wisconsin, Minnesota, Oregon and California. I say its influence has been as broad, of course I will not say as deep, as any institution of education in the United States. It does not seem to me there should be any jealousy existing between it and the academies. I am sure there is nothing of that sort on its part, and there ought not to be any on the part of academies; I think it a very unjust thing on the part of the academies if such a feeling exists. I do not wish the impression to prevail among those present from the paper just read that this institution has gone outside of its legitimate work, which it has endeavored to do fairly and well.

Principal HILL — Mr. Chancellor, in reference to the school of which the gentleman who has just spoken is principal, I am quite prepared to believe all that he has said. But I am very sure that in other normal schools the purpose for which they were established has not been carried out. I do not say that in very many instances it is done on the face of it. There are certain conditions under which a young man enters a normal school. One of the conditions is that he shall teach. Well the fact of the matter is I have failed to find many boys who do not intend to teach. In fact most boys do. But it is very easy to evade the conditions. I have in my mind a young man who is preparing for entering a college. He attended an academy to secure the education necessary to enter. He was a young man working his own way through. But he found that in a certain normal school he could get free tuition up to the desired point and then go on with his college studies. Now this young man does not intend to teach. He intends to take the college course, and he may cover the conditions prescribed upon his entering the normal school, but he does not intend to make a business of teaching.

Principal FARR — Mr. Chancellor, I wish to say to the gentlemen here present at this Convocation, that the paper which has just been read is one of the truest papers I have ever heard read on this floor, and the great point is in regard to the work of academies with reference to classical education. This is a question of interest to all friends of education. Now the question comes: what is the relative worth of the work that was done by the old-time academy and that done by the State public school. I have only words of praise for those high school departments in our larger cities, for they are doing admirable work; but in the smaller places it seems to me that the so-called classical work is a mere sham, and so much so that they are wholly inadequate to do the work, and the tendency is to discourage it. And, wherever it has been done or attempted to be done, where it is sought to have the pupils receive the education due to a large number of the masses, it has been a failure, and, hence, it is utterly impossible, in my opinion, for effectual classical work to be done in our public schools, and the result is that, unless something is done to eradicate the evil, classical education must go to the wall. In conversation with several of the presidents

of leading educational institutions in the New England States, their universal testimony was that the public high schools of New England could not fit boys for college satisfactorily. If they cannot do it where can it be done in our public schools? They have had years of experience before the New York high schools were established; they have been encouraged, but the testimony of Presidents Loyd and Chadbourn is that the work has not been done well. Now it seems to me that it is the business of all the friends of education in New York to rally around the academies and build them up and encourage them, make them the center around which classical education shall cluster. Let the public schools do this work, if you please, but keep the academies. Make them feeders for our colleges, and make them centers of religious thought and religious culture, which we all know cannot be done in our public schools.

Superintendent COLE, of Albany — Mr. Chancellor, Ladies and Gentlemen: Our experience in our city has been this; our high school, although smaller than the high schools of larger cities, has been a success. The young gentlemen who have elected to take the classical course have increased in number each year. It is optional whether they will take the classical or English course. I find that our school is a success and merits the confidence of our people; this is so not only numerically but in every way. We have had twenty years' experience and find that it has proved what we expected from it. I believe the Albany High School here to be an eminent school. I do not see but the classical work done there is quite as well done as in any academy in the State. I have had experience in attending two academies, and I will say that the work was done well. I had a conversation with Dr. Woolworth about the Exeter Academy, and I have talked with other gentlemen about other academies, and they were successful; but no more so it seems to me than our high schools in the State. The grades of scholarship were no better, and if some of the academies don't succeed it seems to me they do not employ as high a grade of talent as those which have more success. I take exception to the moral point made in the paper. I have been familiar with two academies and have had experience as to their method of moral training, and I think the moral training for practice, precept and example is of a higher order in our high school, and it is intentionally so, and it is as successful as in either of the institutions with which I have been familiar. It does not follow that no moral inspiration is got in our schools because it is not a daily recitation. It depends upon the moral status of the teacher who is at the head of the institution for example and precept, and it seems to be done and not neglected as suggested. In regard to religious matters I have nothing to say. They have been weeded out of our public schools. I see no damage. Take any ten pupils in our public schools and any ten in our private schools or academies, and I believe the effect of moral precept and example, as exhibited by these pupils, will compare favorably with any academy or parish school in our State.

Principal HILL—I came here with the desire to see whether there is an answer to the argument brought up. I want, in reference to the quality of the instruction given in academies, to answer the question, "Why do you not hire better teachers?" in this way. An Irishman went to a farmer and wanted to hire out to work. The farmer asked him, "Can you hold a plow?" and he answered, "Yes." The farmer gave him a team and plow with instructions to plow a certain piece of land, and left him. When the farmer returned he found no work done, the man standing there, and he asked him what he meant by saying he could hold a plow when he could not. "Faith," said the Irishman, "how could oi, when two horses wur pullin' it away from me?" So with instruction in academies. How can we hold on to it when the whole State is drawing it away from us? I understand my friend to say he cannot see the injury of the withdrawal of religious training from the schools. That's just the fault, that these people cannot see the effects of drawing religious instruction from it. Yet there are a great many Christians throughout this State who do see the effect of it, and when we have a trustee of Cornell saying he wants religious feeling weeded out of our educational institutions, I say I am in this a Roman Catholic, for I believe the Roman Catholics have better views of this subject.

Principal CHENEY, of Kingston—I desire simply to propound an inquiry that has come to my mind in hearing the very excellent paper that has been read this morning. I know it to be a fact that in many of the places of this State that there were institutions known under the name of academies that were simply dying of dry rot. They were well endowed, and I knew them to be in locations, too, where there were no union free schools that could possibly affect them in that way, but they were dying; but these same academies, since they were brought under the free school law, have taken in new life, and they are to-day doing work which I believe to be equal to the best work the old academies ever did. Now the criticism that these academies ought to have some credit even at the present time for the work they are doing, or for the fact that they were dying under the old control, was in the way, and the fact that by being placed under the union free school law has resuscitated them again and brought the advantages of secondary education to these places. It seems to me a great good has been done by these academies being placed under this union free school law, a very great advantage, it seems to me. I know one of the best tax payers in my city said to me the other day, "I glory in the fact that although paying very heavy taxes for the support of these institutions, I glory in the fact that the poorest boy in the city can be placed at the college door with but little expense to himself." In the last class graduating from the academy to which I refer were four young men; one went immediately into business, two prepared for college, one received a Regents' diploma. This institution yet goes by the name of academy; now it is essentially a union free school and is supported by the State largely, and now is trying to do that work. And so far as its board

of education is concerned that board believes that it is doing that work, and yet fifteen years ago it was impossible for a young man to go through and obtain the education which he desired in order to pass him to the college door. And it is so, so far as the regular academic course is concerned. One of these young men finds an opening in a large business house in a flourishing city in the west, having been prepared in that academy, not caring to go farther. So far as moral instruction is concerned I concur with the gentleman that if we have, at the head of these academies, men imbued with the necessity of inculcating great moral principles in the minds of the young men and young ladies we need have no fear. There is no one on this floor who will not contend for the doctrines of Christianity — no man who desires more that our youth shall be moral than myself. It seems to me we need have no controversy here. I always said I would read a chapter of the Bible and make a prayer before the students before beginning the work of the day. I have always insisted upon the right and always obtained the right. I have said it is perfectly right that you should allow me as representing certain people in this place who send pupils to this school and are supporting it by taxation — as representing them it is but just that this school should be opened with prayer, providing I do not infringe upon the rights of anybody else. I will not compel any one who does not wish or whose parents do not wish him to come and listen to the Bible reading and prayer being made. I have invariably said and have had Jewish, Catholic and otherwise, you need not come to morning exercises if you do not desire to, and I want to say to this Convocation that I have not found a single one who did not want to come. That settled the matter. And by a recognition of that higher power that controls the destinies of the world as we come into his presence and ask his aid in all these ways we have endeavored to teach the essential elements of morality and Christianity as they are being taught by Christians in this free America of ours. So it seems to me if these matters will be handled kindly, and consistently in this regard, we need have no fear.

Principal BRADLEY, of Albany — I was very much interested in this paper that has been read. I wish to hear the strongest representation of that aspect of the question and I have listened with great interest to it, and to the discussion. I do not propose to reply to any thing that paper says. I do not think any thing can be said on the subject more than has already been thoroughly discussed in the public prints and I think it is useless to go into any argument. I do not think there is any occasion, for the feeling seemed to me to be exhibited in the discussion here. We are a unit. We are engaged in educational work — some in the great department of higher educational work. There is certainly room enough for us all. There is no ground for engaging in the discussion here. Let us engage in things pertinent to educational matters, rather than in things pertaining to matters of this kind. Further than that it has been a matter of my observation that the work of the men who teach the

public schools and the work of the men who teach schools where a tuition fee is paid have blended harmoniously together. I have to learn one single instance where either party has received benefit from contention. Pardon me in speaking of Albany. I can testify regarding educational institutions here. Six years ago there were, in this whole city of Albany, 100 academic scholars. At that time the project was considered. An effort was made to retain them at least until the next year when the year's school would be done in this city. At that time 140 scholars were found to present themselves for admission to that school. They have gained, and as years went on for ten years the other schools have gained also. One high school had 500. The other institutions had 500 more. There were ten times as many as before. The projected high school was started. The idea that there is not room for all to work in the department of higher education is a false one. There is room enough for all the colleges, all the high schools and all the academies. I wish they were better and more of them. I protest against narrowing the gates of education.

Regent FITCH — I want to express my profound gratitude to the author of this paper for what I regard to be sound educational truth, and I think it is but fair to enter at least my individual protest in regard to the remarks of Principal Bradley. I quite fail to see how matters, which may involve discussion of fundamental matters upon which we differ, should not be brought into the University Convocation. It seems to me it is precisely the place where the most earnest searching, profound practical discussion should be had, that truth may be evolved therefrom. I speak with a good deal of feeling upon this subject and I hail this paper and the Principal of Cook Academy because it seems to me that it proves the proposition that after all "truth will cry aloud even in the wilderness." For the last ten or fifteen years the sweep of educational thought, as directed by prominent educational men in this State, has been in favor of the utmost license of the State in educational matters. The sweep has seemed to be general and I fear it has been resistless. Several years ago, at the State Teachers' Association at Watkins, I ventured to raise my voice upon the line the principal of Cook Academy has initiated to-day. Such a storm was raised, that I practically retired to a corner, because I am not gifted I fear with that zeal which fights against insurmountable obstacles, and I have felt for the last four or five years that practically the friends of State education in all its departments and through all its ramifications were getting the best of us practically who held opposite opinions. But to-day my thought is just as clear and my logic is just as convincing as it was six or seven years ago; I fail to see now as I failed to see then how the State has any right to educate above that point which will enable the students which it educates to exercise the elective franchise intelligently; this I see with quite as much force as the author of this paper. When you reach the realm of higher education where the questions of theology

and education inevitably blend themselves with educational processes, I fail to see any right on the part of the State to deal with such education. Therefore my thought is just as clear now as it was then, although the trend of thought, the trend of public action, has been in the contrary direction. There are, however, occasionally men brave enough as this man has been, brave enough to-day to rise and state in unequivocal terms the obverse of these in favor of State education. It may seem singular, it may seem impertinent in one who occupies by the favor of his fellow-citizens the position which I occupy to-day — but the trend of public opinion is that the Regents didn't do much practically any way, but the supervision of the higher educational institute of the State. Honorable, just and right I think, for I think my action with this body in stating my advocacy under any circumstances that the State had no rights to interfere by largesses, by benefices in the way of charity with higher education or even secondary education, I should consider myself inappropriately placed and probably should not continue. I see no inappropriateness in that opposition and I recognize no flaw in the truth of the logic which Prof. Hill has so well ennunciated to-day. There is much confusion in regard to the position of the State to education. It may seem as if we should hold this opinion without groping to find in the past some deserted theories of education. That must lead to truth as it seems to us. The vast majority of educators in the State hold a different position. You are to be troubled from time to time with the uprising of this old question, which like the questions which vex nations from time to time, will not down, and I believe that finally we are to settle upon some such propositions as those advocated by the gentleman in his able paper. I confess in conclusion that having given some practical attention to this matter that I do feel to grieve for these grand old academies whose names are historic in the State of New York (name them) and others in the center of New York with which I am familiar. I do not believe we shall have better under the new law, and all the traditions of scholarship which are associated with them have gone into decay and deterioration. It is not to me a pleasant reflection and I believe that a scholarship of the secondary type preliminary to entering college was better done, was more thoroughly administered, produced better results when these academies were in a flourishing state than they do now giving secondary education up to the control of the State.

Principal WINNE, of Canastota — I do not wish to say much upon this question, but upon both sides the thought seems to be advanced that our colleges are to be fed, our seminaries to be sustained, and the public schools sustained. Is it not that our pupils, our boys and our girls to be educated, not the schools sustained? Though I was educated at one of these private academies, I see now running through its whole system a tendency to build up the school without the thorough development of the man. The development of the man was not because these academies were not sustained. The

whole cry of the community and the State is a call for men who shall take charge of our State work and skillfully take and build up one grand State school, the same as one man has to be built up and developed, and not in one line, but in every line. Pardon one suggestion in regard to our Regents' work. Well, in regard to the union schools. There the morality is fully equal to and superior to the academies, two of which I have attended. I find that the academy is built up in spite of what you may say of the union schools, because better advantages are offered. In regard to religious influence, we have had fault to find in regard to some union schools; we have had fault to find in regard to some academies, and because the people felt they were being asked to pay for religious instruction. Then we infringe upon the rights or tenets of neither Catholic, Jew or any other denomination.

Professor O'LEARY, of Manhattan College — I wish to make a few remarks in reference to the paper which has just been read, that part of it that discusses the religious aspect of education in our schools. Of course the laws are of the fullest toleration, and therefore religion is of necessity to be excluded from all schools participating in the State support. Is it possible really to accomplish such a result? If we limit education to its lowest phases perhaps such a result is feasible, but if we rise above the service of at least intermediate or secondary education, we are at once brought face to face with these religious problems. Whether education of that character may be maintained to the entire exclusion of the religious element is the great question. My impression is that it is not possible; for the educator must leave upon the pupil impressions of his own education. If he has, in other words, he must stamp his whole individuality upon the scholar. He must communicate it to his pupil. That pupil is of an inquisitive turn of mind, seeking information. He is sure to go outside of his studies. To whom will he address himself? Why, most naturally to his instructor in the school. That instructor has either to appear in that emasculated shape of a non-committal teacher who dares not trench upon religious or theological questions, or he must give his information to the pupil colored with such impressions and showing the character of the views that he had imbibed early in his own life-time. Will not this instruction partake naturally of the religious character? There is not one question, or there are but few questions in the whole range of history, hardly a question coming up for discussion that will not necessarily involve something of this religious character. The pupil will invariably receive from his instructor views thus colored. It seems to me that the entire exclusion of religious instruction from the higher departments of education must result in either of two things: either the teacher must refuse to give information to the pupils on the ground that religious matter is prohibited, or else give him the benefit of his views, impress upon the pupil his own individuality in all its fullness, and so impress upon the child what appears to be the stamp of the teacher's own ideas, showing the phy-

sical and moral lineaments or traits of his parent, and so makes the pupil of the moral and intellectual order practically of the moral and intellectual characteristics of his teacher, and let these be Christian or anti-Christian, of this or that denomination, the pupil, if he is to be framed by the life or after the fashion of the teacher, must reflect the views colored by his own individuality.

Principal JOSLIN, of Belleville — The religious aspects of this question. I don't know much about them; but there seems no reason whatever by which one man should be compelled to pay for another man's child. If a town, village or city wishes to tax itself for education it should have the right to do as it wishes. The normal schools are supported by money drawn from the public treasury, and no private enterprise should be compelled to struggle against institutions supported by money so drawn. It does not impress many of the citizens of Brooklyn favorably, this idea of a young man learning Latin in Oswego, for which the farmer in Chautauqua pays; another learning Greek in Potsdam, whose tuition is paid for by the man in Brooklyn.

Principal SMITH, of Lansingburgh — This aspect of the question was alluded to by Principal Thurber in a paper read two years ago at the State Teachers' Association in Saratoga. I have thought of it since many times. It is my fortune to represent one of the smaller academies which has survived the destruction of time. I have previously taught in two union schools, have had some graduated pupils in all these schools. I have observed more independent vigor of thought in those from the academies. Am constrained to believe it arose from the condition of paying a tuition fee. When a pupil pays a tuition fee he must desire to accomplish as much as possible, and get the benefit of his money. Therefore, the effect upon the pupil of paying a tuition fee is good and ought not to be destroyed.

Regent LEAVENWORTH — Nothing surprises me so much in this whole discussion as that so many gentlemen who have expressed their minds upon this subject and alluded to education in academies should have made no relation whatever to one of the great causes of it, which it seems to me ought to have struck their minds very plainly; this is the entire want of children in the country. There is the foundation of the decay of academies — it is the great foundation. I am sure that you gentlemen who sit here cannot have examined the statistics of the State of New York. If you look into the census of 1865 — and probably in the census of any other period, you will see the same result — look into the census of 1865 you will find that the census shows out of 780,000 there were 200,000 families, very nearly, in which there was not a child. This is a fact not true in any civilized country, or in any uncivilized country either; in any part of the world is there such a state of things as that. There were about 150,000 families and in each there was one child; nearly 150,000 more in which there were two children. Nothing of that kind existed since the decay of the Roman Empire. The same

state of things existed then. No one could be a member of the Roman legion who was not a Roman citizen. Under such a condition of things as this the Roman empire went down. I do not say the American government is going down, but there is a vast amount of degeneracy in the American people. It has degraded wonderfully in the last few years. Who composed that 250,000? You have got to find in that particular an entire Irish, German, English and Scotch and foreign population. You will find there quite a large number of American families. It looks to me very much as if there was not any American families in the State of New York, and as if there was not more than one child to a family. Now this is not true of the Americans, nor of the American Indians. Yet this is what the statistics of the State of New York show. Why be surprised then that academies are dead and dying? When I went to [illegible] more than fifty years ago, there were in my village as many as six children to a family. Now you will hardly find a man who has as many grandchildren as he has children. A short time since I was talking with an old gentleman who lives in the [illegible] who went to school there in the [illegible] part of the century. He told me the [illegible] was the same size as it was then, and then it had 130 children in that school [illegible] [illegible] of the [illegible] [illegible] in [illegible] is an- [illegible] with the [illegible] years ago I was [illegible] is the great difficulty [illegible] large families [illegible] I would [illegible] statistics [illegible] of the [illegible] When [illegible] he [illegible] of the [illegible] some [illegible] general

committee of the Legislature several years ago. This question arises, and it is all I wish to say on that point. If the normal schools are to be forbidden to give instruction in the higher subjects, where are the teachers to come from in the future to teach these higher subjects? The normal schools were created by the State to make teachers. Without the possibility of their teaching students in Latin and Greek where will be the principals — where the teachers in Latin and Greek to come from? If a person desires to be a teacher, and finds himself in a normal school, we must not look to graduates from colleges for principals of academies and principals of union schools academic departments. The graduates of almost every college in existence seek the higher professions, that of lawyer, minister, doctor, in preference to the drudgery of the teacher of the school. How many are there come to be teachers? Where are the teachers to come from if normal schools are deprived of the privilege of teaching the higher subjects? This question is germane to the discussion. I want to make another point on the discussion. This paper seems to be the plea of one or two things. It seems to me that it is blindness not to accept learning from what has been. Those nations have been greatest where the State saw to it that its citizens were educated, and those States have been weakest where the State interfered with the religious sentiments of the people. Let us in the State of New York remember what has been, let the State superintend and direct education from the little boy and the primary department of the lowest union school in the common course in the State of New York to the time when he takes his diploma in the highest degree in the State University. I believe it to be in the power, to be the right of the State of New York in its sovereign capacity to give its citizen a right to know what is to be known. I want to refer to another point. This attack was made on the union schools, and did not represent the normal schools and colleges, but did the union schools. My school is half way between the university referred to and the Cortland Normal School. When our young men or young ladies are large enough to take the higher branches, a large majority of them leave to go to the normal school. But I can look at this matter, laying aside all personal and all selfish feeling. I have said it is better for them to be there then, where they are to hear able professors and are furnished with apparatus and furnished every thing needed to build up a great institution. I believe it is better for him to be there than in a union school or academy. I am willing, although I suffer, I am willing to see the boy or girl leave me and go there, and I believe that in this matter the fittest will survive. It has become an axiom in this generation that the fittest shall survive. There is a cause for it; it is time if the people of the State of New York are ready and willing to go there, let the academies die. It is because the people want it so, and we shall do what the people believe to be best, and it shall triumph in the end.

Brother ANTHONY, of Manhattan College — Mr. Chancellor: I

schools in great measure in the States of Wisconsin, Minnesota, Oregon and California. I say its influence has been as broad, of course I will not say as deep, as any institution of education in the United States. It does not seem to me there should be any jealousy existing between it and the academies. I am sure there is nothing of that sort on its part, and there ought not to be any on the part of academies; I think it a very unjust thing on the part of the academies if such a feeling exists. I do not wish the impression to prevail among those present from the paper just read that this institution has gone outside of its legitimate work, which it has endeavored to do fairly and well.

Principal HILL — Mr. Chancellor, in reference to the school of which the gentleman who has just spoken is principal, I am quite prepared to believe all that he has said. But I am very sure that in other normal schools the purpose for which they were established has not been carried out. I do not say that in very many instances it is done on the face of it. There are certain conditions under which a young man enters a normal school. One of the conditions is that he shall teach. Well the fact of the matter is I have failed to find many boys who do not intend to teach. In fact most boys do. But it is very easy to evade the conditions. I have in my mind a young man who is preparing for entering a college. He attended an academy to secure the education necessary to enter. He was a young man working his own way through. But he found that in a certain normal school he could get free tuition up to the desired point and then go on with his college studies. Now this young man does not intend to teach. He intends to take the college course, and he may cover the conditions prescribed upon his entering the normal school, but he does not intend to make a business of teaching.

Principal FARR — Mr. Chancellor, I wish to say to the gentlemen here present at this Convocation, that the paper which has just been read is one of the truest papers I have ever heard read on this floor, and the great point is in regard to the work of academies with reference to classical education. This is a question of interest to all friends of education. Now the question comes: what is the relative worth of the work that was done by the old-time academy and that done by the State public school. I have only words of praise for those high school departments in our larger cities, for they are doing admirable work; but in the smaller places it seems to me that the so-called classical work is a mere sham, and so much so that they are wholly inadequate to do the work, and the tendency is to discourage it. And, wherever it has been done or attempted to be done, where it is sought to have the pupils receive the education due to a large number of the masses, it has been a failure, and, hence, it is utterly impossible, in my opinion, for effectual classical work to be done in our public schools, and the result is that, unless something is done to eradicate the evil, classical education must go to the wall. In conversation with several of the presidents

of leading educational institutions in the New England States, their universal testimony was that the public high schools of New England could not fit boys for college satisfactorily. If they cannot do it where can it be done in our public schools? They have had years of experience before the New York high schools were established; they have been encouraged, but the testimony of Presidents Loyd and Chadbourn is that the work has not been done well. Now it seems to me that it is the business of all the friends of education in New York to rally around the academies and build them up and encourage them, make them the center around which classical education shall cluster. Let the public schools do this work, if you please, but keep the academies. Make them feeders for our colleges, and make them centers of religious thought and religious culture, which we all know cannot be done in our public schools.

Superintendent COLE, of Albany — Mr. Chancellor, Ladies and Gentlemen: Our experience in our city has been this; our high school, although smaller than the high schools of larger cities, has been a success. The young gentlemen who have elected to take the classical course have increased in number each year. It is optional whether they will take the classical or English course. I find that our school is a success and merits the confidence of our people; this is so not only numerically but in every way. We have had twenty years' experience and find that it has proved what we expected from it. I believe the Albany High School here to be an eminent school. I do not see but the classical work done there is quite as well done as in any academy in the State. I have had experience in attending two academies, and I will say that the work was done well. I had a conversation with Dr. Woolworth about the Exeter Academy, and I have talked with other gentlemen about other academies, and they were successful; but no more so it seems to me than our high schools in the State. The grades of scholarship were no better, and if some of the academies don't succeed it seems to me they do not employ as high a grade of talent as those which have more success. I take exception to the moral point made in the paper. I have been familiar with two academies and have had experience as to their method of moral training, and I think the moral training for practice, precept and example is of a higher order in our high school, and it is intentionally so, and it is as successful as in either of the institutions with which I have been familiar. It does not follow that no moral inspiration is got in our schools because it is not a daily recitation. It depends upon the moral status of the teacher who is at the head of the institution for example and precept, and it seems to be done and not neglected as suggested. In regard to religious matters I have nothing to say. They have been weeded out of our public schools. I see no damage. Take any ten pupils in our public schools and any ten in our private schools or academies, and I believe the effect of moral precept and example, as exhibited by these pupils, will compare favorably with any academy or parish school in our State.

Principal HILL—I came here with the desire to see whether there is an answer to the argument brought up. I want, in reference to the quality of the instruction given in academies, to answer the question, "Why do you not hire better teachers?" in this way. An Irishman went to a farmer and wanted to hire out to work. The farmer asked him, "Can you hold a plow?" and he answered, "Yes." The farmer gave him a team and plow with instructions to plow a certain piece of land, and left him. When the farmer returned he found no work done, the man standing there, and he asked him what he meant by saying he could hold a plow when he could not. "Faith," said the Irishman, "how could oi, when two horses wur pullin' it away from me?" So with instruction in academies. How can we hold on to it when the whole State is drawing it away from us? I understand my friend to say he cannot see the injury of the withdrawal of religious training from the schools. That's just the fault, that these people cannot see the effects of drawing religious instruction from it. Yet there are a great many Christians throughout this State who do see the effect of it, and when we have a trustee of Cornell saying he wants religious feeling weeded out of our educational institutions, I say I am in this a Roman Catholic, for I believe the Roman Catholics have better views of this subject.

Principal CHENEY, of Kingston—I desire simply to propound an inquiry that has come to my mind in hearing the very excellent paper that has been read this morning. I know it to be a fact that in many of the places of this State that there were institutions known under the name of academies that were simply dying of dry rot. They were well endowed, and I knew them to be in locations, too, where there were no union free schools that could possibly affect them in that way, but they were dying; but these same academies, since they were brought under the free school law, have taken in new life, and they are to-day doing work which I believe to be equal to the best work the old academies ever did. Now the criticism that these academies ought to have some credit even at the present time for the work they are doing, or for the fact that they were dying under the old control, was in the way, and the fact that by being placed under the union free school law has resuscitated them again and brought the advantages of secondary education to these places. It seems to me a great good has been done by these academies being placed under this union free school law, a very great advantage, it seems to me. I know one of the best tax payers in my city said to me the other day, "I glory in the fact that although paying very heavy taxes for the support of these institutions, I glory in the fact that the poorest boy in the city can be placed at the college door with but little expense to himself." In the last class graduating from the academy to which I refer were four young men; one went immediately into business, two prepared for college, one received a Regents' diploma. This institution yet goes by the name of academy; now it is essentially a union free school and is supported by the State largely, and now is trying to do that work. And so far as its board

of education is concerned that board believes that it is doing that work, and yet fifteen years ago it was impossible for a young man to go through and obtain the education which he desired in order to pass him to the college door. And it is so, so far as the regular academic course is concerned. One of these young men finds an opening in a large business house in a flourishing city in the west, having been prepared in that academy, not caring to go farther. So far as moral instruction is concerned I concur with the gentleman that if we have, at the head of these academies, men imbued with the necessity of inculcating great moral principles in the minds of the young men and young ladies we need have no fear. There is no one on this floor who will not contend for the doctrines of Christianity — no man who desires more that our youth shall be moral than myself. It seems to me we need have no controversy here. I always said I would read a chapter of the Bible and make a prayer before the students before beginning the work of the day. I have always insisted upon the right and always obtained the right. I have said it is perfectly right that you should allow me as representing certain people in this place who send pupils to this school and are supporting it by taxation — as representing them it is but just that this school should be opened with prayer, providing I do not infringe upon the rights of anybody else. I will not compel any one who does not wish or whose parents do not wish him to come and listen to the Bible reading and prayer being made. I have invariably said and have had Jewish, Catholic and otherwise, you need not come to morning exercises if you do not desire to, and I want to say to this Convocation that I have not found a single one who did not want to come. That settled the matter. And by a recognition of that higher power that controls the destinies of the world as we come into his presence and ask his aid in all these ways we have endeavored to teach the essential elements of morality and Christianity as they are being taught by Christians in this free America of ours. So it seems to me if these matters will be handled kindly, and consistently in this regard, we need have no fear.

Principal BRADLEY, of Albany — I was very much interested in this paper that has been read. I wish to hear the strongest representation of that aspect of the question and I have listened with great interest to it, and to the discussion. I do not propose to reply to any thing that paper says. I do not think any thing can be said on the subject more than has already been thoroughly discussed in the public prints and I think it is useless to go into any argument. I do not think there is any occasion, for the feeling seemed to me to be exhibited in the discussion here. We are a unit. We are engaged in educational work — some in the great department of higher educational work. There is certainly room enough for us all. There is no ground for engaging in the discussion here. Let us engage in things pertinent to educational matters, rather than in things pertaining to matters of this kind. Further than that it has been a matter of my observation that the work of the men who teach the

public schools and the work of the men who teach schools where a tuition fee is paid have blended harmoniously together. I have to learn one single instance where either party has received benefit from contention. Pardon me in speaking of Albany. I can testify regarding educational institutions here. Six years ago there were, in this whole city of Albany, 100 academic scholars. At that time the project was considered. An effort was made to retain them at least until the next year when the year's school would be done in this city. At that time 140 scholars were found to present themselves for admission to that school. They have gained, and as years went on for ten years the other schools have gained also. One high school had 500. The other institutions had 500 more. There were ten times as many as before. The projected high school was started. The idea that there is not room for all to work in the department of higher education is a false one. There is room enough for all the colleges, all the high schools and all the academies. I wish they were better and more of them. I protest against narrowing the gates of education.

Regent FITCH — I want to express my profound gratitude to the author of this paper for what I regard to be sound educational truth, and I think it is but fair to enter at least my individual protest in regard to the remarks of Principal Bradley. I quite fail to see how matters, which may involve discussion of fundamental matters upon which we differ, should not be brought into the University Convocation. It seems to me it is precisely the place where the most earnest searching, profound practical discussion should be had, that truth may be evolved therefrom. I speak with a good deal of feeling upon this subject and I hail this paper and the Principal of Cook Academy because it seems to me that it proves the proposition that after all "truth will cry aloud even in the wilderness." For the last ten or fifteen years the sweep of educational thought, as directed by prominent educational men in this State, has been in favor of the utmost license of the State in educational matters. The sweep has seemed to be general and I fear it has been resistless. Several years ago, at the State Teachers' Association at Watkins, I ventured to raise my voice upon the line the principal of Cook Academy has initiated to-day. Such a storm was raised, that I practically retired to a corner, because I am not gifted I fear with that zeal which fights against insurmountable obstacles, and I have felt for the last four or five years that practically the friends of State education in all its departments and through all its ramifications were getting the best of us practically who held opposite opinions. But to-day my thought is just as clear and my logic is just as convincing as it was six or seven years ago; I fail to see now as I failed to see then how the State has any right to educate above that point which will enable the students which it educates to exercise the elective franchise intelligently; this I see with quite as much force as the author of this paper. When you reach the realm of higher education where the questions of theology

and education inevitably blend themselves with educational processes, I fail to see any right on the part of the State to deal with such education. Therefore my thought is just as clear now as it was then, although the trend of thought, the trend of public action, has been in the contrary direction. There are, however, occasionally men brave enough as this man has been, brave enough to-day to rise and state in unequivocal terms the obverse of these in favor of State education. It may seem singular, it may seem impertinent in one who occupies by the favor of his fellow-citizens the position which I occupy to-day — but the trend of public opinion is that the Regents didn't do much practically any way, but the supervision of the higher educational institute of the State. Honorable, just and right I think, for I think my action with this body in stating my advocacy under any circumstances that the State had no rights to interfere by largesses, by benefices in the way of charity with higher education or even secondary education, I should consider myself inappropriately placed and probably should not continue. I see no inappropriateness in that opposition and I recognize no flaw in the truth of the logic which Prof. Hill has so well ennunciated to-day. There is much confusion in regard to the position of the State to education. It may seem as if we should hold this opinion without groping to find in the past some deserted theories of education. That must lead to truth as it seems to us. The vast majority of educators in the State hold a different position. You are to be troubled from time to time with the uprising of this old question, which like the questions which vex nations from time to time, will not down, and I believe that finally we are to settle upon some such propositions as those advocated by the gentleman in his able paper. I confess in conclusion that having given some practical attention to this matter that I do feel to grieve for these grand old academies whose names are historic in the State of New York (name them) and others in the center of New York with which I am familiar. I do not believe we shall have better under the new law, and all the traditions of scholarship which are associated with them have gone into decay and deterioration. It is not to me a pleasant reflection and I believe that a scholarship of the secondary type preliminary to entering college was better done, was more thoroughly administered, produced better results when these academies were in a flourishing state than they do now giving secondary education up to the control of the State.

Principal WINNE, of Canastota — I do not wish to say much upon this question, but upon both sides the thought seems to be advanced that our colleges are to be fed, our seminaries to be sustained, and the public schools sustained. Is it not that our pupils, our boys and our girls to be educated, not the schools sustained? Though I was educated at one of these private academies, I see now running through its whole system a tendency to build up the school without the thorough development of the man. The development of the man was not because these academies were not sustained. The

whole cry of the community and the State is a call for men who shall take charge of our State work and skillfully take and build up one grand State school, the same as one man has to be built up and developed, and not in one line, but in every line. Pardon one suggestion in regard to our Regents' work. Well, in regard to the union schools. There the morality is fully equal to and superior to the academies, two of which I have attended. I find that the academy is built up in spite of what you may say of the union schools, because better advantages are offered. In regard to religious influence, we have had fault to find in regard to some union schools; we have had fault to find in regard to some academies, and because the people felt they were being asked to pay for religious instruction. Then we infringe upon the rights or tenets of neither Catholic, Jew or any other denomination.

Professor O'LEARY, of Manhattan College — I wish to make a few remarks in reference to the paper which has just been read, that part of it that discusses the religious aspect of education in our schools. Of course the laws are of the fullest toleration, and therefore religion is of necessity to be excluded from all schools participating in the State support. Is it possible really to accomplish such a result? If we limit education to its lowest phases perhaps such a result is feasible, but if we rise above the service of at least intermediate or secondary education, we are at once brought face to face with these religious problems. Whether education of that character may be maintained to the entire exclusion of the religious element is the great question. My impression is that it is not possible; for the educator must leave upon the pupil impressions of his own education. If he has, in other words, he must stamp his whole individuality upon the scholar. He must communicate it to his pupil. That pupil is of an inquisitive turn of mind, seeking information. He is sure to go outside of his studies. To whom will he address himself? Why, most naturally to his instructor in the school. That instructor has either to appear in that emasculated shape of a non-committal teacher who dares not trench upon religious or theological questions, or he must give his information to the pupil colored with such impressions and showing the character of the views that he had imbibed early in his own life-time. Will not this instruction partake naturally of the religious character? There is not one question, or there are but few questions in the whole range of history, hardly a question coming up for discussion that will not necessarily involve something of this religious character. The pupil will invariably receive from his instructor views thus colored. It seems to me that the entire exclusion of religious instruction from the higher departments of education must result in either of two things: either the teacher must refuse to give information to the pupils on the ground that religious matter is prohibited, or else give him the benefit of his views, impress upon the pupil his own individuality in all its fullness, and so impress upon the child what appears to be the stamp of the teacher's own ideas, showing the phy-

sical and moral lineaments or traits of his parent, and so makes the pupil of the moral and intellectual order practically of the moral and intellectual characteristics of his teacher, and let these be Christian or anti-Christian, of this or that denomination, the pupil, if he is to be framed by the life or after the fashion of the teacher, must reflect the views colored by his own individuality.

Principal JOSLIN, of Belleville — The religious aspects of this question. I don't know much about them; but there seems no reason whatever by which one man should be compelled to pay for another man's child. If a town, village or city wishes to tax itself for education it should have the right to do as it wishes. The normal schools are supported by money drawn from the public treasury, and no private enterprise should be compelled to struggle against institutions supported by money so drawn. It does not impress many of the citizens of Brooklyn favorably, this idea of a young man learning Latin in Oswego, for which the farmer in Chautauqua pays; another learning Greek in Potsdam, whose tuition is paid for by the man in Brooklyn.

Principal SMITH, of Lansingburgh — This aspect of the question was alluded to by Principal Thurber in a paper read two years ago at the State Teachers' Association in Saratoga. I have thought of it since many times. It is my fortune to represent one of the smaller academies which has survived the destruction of time. I have previously taught in two union schools, have had some graduated pupils in all these schools. I have observed more independent vigor of thought in those from the academies. Am constrained to believe it arose from the condition of paying a tuition fee. When a pupil pays a tuition fee he must desire to accomplish as much as possible, and get the benefit of his money. Therefore, the effect upon the pupil of paying a tuition fee is good and ought not to be destroyed.

Regent LEAVENWORTH — Nothing surprises me so much in this whole discussion as that so many gentlemen who have expressed their minds upon this subject and alluded to education in academies should have made no relation whatever to one of the great causes of it, which it seems to me ought to have struck their minds very plainly; this is the entire want of children in the country. There is the foundation of the decay of academies — it is the great foundation. I am sure that you gentlemen who sit here cannot have examined the statistics of the State of New York. If you look into the census of 1865 — and probably in the census of any other period, you will see the same result — look into the census of 1865 you will find that the census shows out of 780,000 there were 200,000 families, very nearly, in which there was not a child. This is a fact not true in any civilized country, or in any uncivilized country either; in any part of the world is there such a state of things as that. There were about 150,000 families and in each there was one child; nearly 150,000 more in which there were two children. Nothing of that kind existed since the decay of the Roman Empire. The same

state of things existed then. No one could be a member of the Roman legion who was not a Roman citizen. Under such a condition of things as this the Roman empire went down. I do not say the American government is going down, but there is a vast amount of degeneracy in the American people. It has degraded wonderfully in the last few years. Who composed that 280,000? You have got to find in that particular an entire Irish, German, English and Scotch and foreign population. You will find there quite a large number of American families. It looks to me very much as if there was not any American families in the State of New York, and as if there was not more than one child to a family. Now this is not true of the African, nor of the American Indians. Yet this is what the statistics of the State of New York show. Why be surprised, then, that academies are dead and dying? When I went to the county of Onondaga, more than fifty years ago, there were in my village as many as six children to a family. Now you will hardly find an old man who has as many grandchildren as he has children. A short time since I was talking with an old gentleman who lives in the south-east corner of the county of Onondaga, who went to school there in the early part of the century. He told me the district now was the same size as it was then, and then it had 130 children in that school district, now they have 25. I talked with a man in the north part of the county. He was boasting to me of the wonderful improvements made in that part of the county. What fine wheat and corn, and how each farm had increased in value. Said I, "you are raising wheat very finely, but there is another article I doubt you raise to any extent. How is it with the children in your school district?" He says thirty years ago I was trustee of that district; it had 150 children in the school; now it has 25, and half of them are foreigners. This is the great difficulty under which these academies are laboring. The town of Pompey was settled from New England. The farmers all had large families of children, and no more remarkable than that very academy. That academy has been dying for years. The same territory that filled that academy fifty years ago now scarcely keeps it alive. I would go farther, but the time has expired. Look into statistics, look into the census of 1855 to 1865 and to 1875. That is the condition of things. We talk about tariff, we talk about the finances of the country, but in all of them there is nothing compared with the evils we are suffering from owing to this destruction of children. When the farmer dies the probability is he did not leave a son, and if he does he leaves him so independent that he wants to come to the city. The farmers are all supplied by the German and the Irishman. There is not a town in the county that is not filled with Germans and Irishmen. I am glad it is so. I am glad there is somebody there who are not degenerate as we are.

Principal LOVELL, of Dryden — The normal schools seem to be without a defender, and I wish to say a word in their support, although no defense is really needed after the report of the special

committee of the Legislature several years ago. This question arises, and it is all I wish to say on that point. If the normal schools are to be forbidden to give instruction in the higher subjects, where are the teachers to come from in the future to teach these higher subjects? The normal schools were created by the State to make teachers. Without the possibility of their teaching students in Latin and Greek where will be the principals — where the teachers in Latin and Greek to come from? If a person desires to be a teacher, and finds himself in a normal school, we must not look to graduates from colleges for principals of academies and principals of union schools academic departments. The graduates of almost every college in existence seek the higher professions, that of lawyer, minister, doctor, in preference to the drudgery of the teacher of the school. How many are there come to be teachers? Where are the teachers to come from if normal schools are deprived of the privilege of teaching the higher subjects? This question is germane to the discussion. I want to make another point on the discussion. This paper seems to be the plea of one or two things. It seems to me that it is blindness not to accept learning from what has been. Those nations have been greatest where the State saw to it that its citizens were educated, and those States have been weakest where the State interfered with the religious sentiments of the people. Let us in the State of New York remember what has been, let the State superintend and direct education from the little boy and the primary department of the lowest union school in the common course in the State of New York to the time when he takes his diploma in the highest degree in the State University. I believe it to be in the power, to be the right of the State of New York in its sovereign capacity to give its citizen a right to know what is to be known. I want to refer to another point. This attack was made on the union schools, and did not represent the normal schools and colleges, but did the union schools. My school is half way between the university referred to and the Cortland Normal School. When our young men or young ladies are large enough to take the higher branches, a large majority of them leave to go to the normal school. But I can look at this matter, laying aside all personal and all selfish feeling. I have said it is better for them to be there then, where they are to hear able professors and are furnished with apparatus and furnished every thing needed to build up a great institution. I believe it is better for him to be there than in a union school or academy. I am willing, although I suffer, I am willing to see the boy or girl leave me and go there, and I believe that in this matter the fittest will survive. It has become an axiom in this generation that the fittest shall survive. There is a cause for it; it is time if the people of the State of New York are ready and willing to go there, let the academies die. It is because the people want it so, and we shall do what the people believe to be best, and it shall triumph in the end.

Brother ANTHONY, of Manhattan College — Mr. Chancellor: I

shall say but two words, called for by the very important data presented to us by the venerable Regent for Syracuse, and something certainly that is a very important feature in this discussion — that is of the children. And I think that if there is such a difference in the number of children to-day in the academies, compared with what were thirty or forty years ago, as we have heard, it strikes me very forcibly that it may be from the tendency of the present day to emasculate the subject of religion in our schools. I will say nothing on the question of excluding the Bible from the schools and from the class. It is a damnable thing for the schools of our State in the teaching, the instruction given in religion in the schools thirty years ago, that we might not have that damnable statement that has been made, and figures brought to bear strongly upon it. That is nearly all the words I want to make. I thank this gentleman who read this paper. He deserves great thanks for having brought up this important subject for discussion.

Principal MOREHOUSE, of Port Byron — I have very frequently heard our State Superintendent, in the meeting of the State association and the commissioners' association, say that the free school system of this State was the crowning glory of this State. I have had to differ with him every time. I believe certainly that the schools of the State of New York were very much better under the old rate bill. I believe that the academies of the State, the higher instruction of the State, was very much better under the old system of academies where there was paid tuition. I believe so from this reason, that what we earn, work for and pay for, we think most of. Now in the work of supervision, where there is a school commissioner visiting 140 schools (in my district), is very often found an absence of scholars. Now the reason of this was because the schools were so free the scholars could take advantage of them any time they saw fit. So they neglected them. They were too free. I think the old academic system is the true system. There good work was done. The young men who made their mark in the world there worked their way as they went along, not like these who have their way paid. I believe in the old system of academies. Pay what you must, make all you can, is the very best system.

Principal CURTIS, of Sodus — I rise to thank the author of this paper for bringing up this discussion. I have no doubt now, I did not have any then, just as Regent Fitch expressed it, when he made his remarks, that it was better for the cause of education that there should be rate-bills for everybody concerned; the primary, secondary college course of education should be so conducted rather than that all merge under one head and be supported by the State.

Principal SMITH, of Lansingburgh Academy, wished to call attention to the effect of tuition paying upon the mental development of the student. He said that being now connected with one of the smaller academies that has survived the destruction alluded to in the paper of Principal Hill, and having been previously connected with two academic departments of union schools, he had found more

vigor of independent thought and more improvement of opportunities among pupils of the same grade and attainments in the academy than in the union schools, and this he attributed to the fact that pupils in the academy pay their tuition, and feel that they must get the worth of their money. Moreover, the feeling that they pay for what they get, and are not beneficiaries, begets an honorable feeling of independence that ought not to be destroyed.

TEACHERS' CLASSES IN ACADEMIES.

A Discussion by Inspector A. B. WATKINS and others.

Inspector A. B. WATKINS — At the time I consented to open this discussion upon classes for instructing common school teachers, I expected to have time to make some formal preparation. Such time has been denied me, and I ask your forbearance in opening the discussion, by making my report to the Board of Regents last January the basis of my remarks, and in including with it some account of the work done since that time.

By an act of the Legislature passed in June, 1882, the Regents were authorized to employ an inspector of the teachers' classes; the classes were placed under the visitation of the school commissioners in their respective districts, who are to assist in the organization and management of the class, and report to the Regents in regard to it; and the conditions of membership in a teachers' class were advanced to the possession of a Regents' preliminary certificate. Such members of teachers' class as pass the final examination of the class and fulfill the other prescribed conditions are granted a testimonial by the Regents, which when indorsed by any school commissioner becomes a license to teach. The questions for the final examination of the class are prepared by the principal and submitted to the school commissioner for his amendment or addition. Thus the examination is or may be in great degree controlled by the commissioner. The testimonials issued to successful members of classes are not certificates or licenses to teach until they have been indorsed by the school commissioner.

Before the passage of the law of 1882, there was no rigid requirement in regard to the admission of pupils to teachers' classes, but the examination for admission was entirely informal. The requirement of a preliminary certificate in the possession of every member of a class to whom a testimonial is issued insures a fair degree of scholarship on the part of all successful members of teachers' classes, and thus gives substantial value to the testimonial as an evidence of attainments. Although the classes are thus under the direction and inspection of the commissioners, and have before them the evidence of work and consequent attainments as shown by the testimonials, the commissioners have in different parts of the State followed different usages in regard to the testimonials. These classes really contain three classes of persons: those who have never taught; those who have taught one or two terms but not long enough to become well established in the work; and those who have had many terms of experience. Under these circumstances the commissioners were at a stand what to do. In some districts they indorsed all the testimonials. In some districts they indorsed none of them. In most cases a middle course has been taken by the commissioners by indorsing the testimonials of those who had had experience in teaching, and by issuing, without further examina-

tion, to those who had not had experience in teaching a third grade certificate, and this seems to be a reasonable course to take. Here several extracts were read from the reports made by school commissioners in regard to the instruction given to teachers' classes, showing the esteem in which they held these classes, and the course pursued by them in regard to the testimonials issued by the Regents.

In most cases heretofore appointments have been made for the instruction of classes for but one term in the year. It is desirable to have here a full expression of opinion in regard to the desirability of longer terms of instruction and also whether some better plan can be devised for the preparation of questions for the final examination of the teachers' classes, and with the suggestion of these topics for discussion, I will leave the floor.

School Commissioner C. E. SURDAM, of Port Washington, followed, speaking of the establishment of the normal school system and the design of the originators. He advocated the normal system. There should be at least twenty-five normal schools in this State. The time has come when the graduates from the high schools cannot go into the public school and instruct the scholars.

Principal HILL was opposed to teachers' classes in academies, first, because the work proposed for them, so far as it is professional, belongs to the normal school, and, so far as it is academic, separate classes are not necessary; second, because under the conditions imposed by the Regents, academies cannot do the work of teachers' classes well without employing an extra teacher; third, because he believed that nine-tenths of those who apply for admission as teachers of classes are abundantly able to pay their own tuition; fourth, because those eligible to classes under the provision of the Regents do not wish to pursue the prescribed studies.

The discussion was continued by Commissioner L. B. NEWELL, Principal HOWARD, of Massena; Principal VERRILL, of Delaware Literary Institute; Principal FARR and Principal LOVELL.

Commissioner L. B. NEWELL — Mr. Chancellor: I appreciate, sir, the honor that has placed me upon the programme and brought me here to-day. And yet I must admit that it is an embarrassing position; first, because I realize that before me are solid men and women; second, because it appears to me, Mr. Wait being absent, that so far as I know, I am the only representative of that class of persons called school commissioners in this body. Another embarrassment is that until Mr. Watkins made his appearance to-day we did not know what point was to be presented for discussion. Another fact which I discovered this forenoon is this: that this convention or convocation, as I understand it, is composed of representatives of colleges, academies and normal schools, and from the experience that we had, and the discussion we listened to this forenoon, I hardly know what to say, for fear I shall stir up antagonism in one party or another. It is a difficult thing to say any thing, and I shall therefore say but little, and thus be on the safe side. I do not think, however, a certain class of representatives

were being pushed to the wall; it was simply the course of events, the work of public sentiment, and if so, we must not try to overcome it or fight against the inevitable. In the whole history of our government public sentiment rules. In whatever condition we find public schools, academies, union schools, normal schools or colleges, their position has been made by the sentiment of the people. In order to get at the exact work of our teachers' classes, as I understand them, it seems to me to run back to the time when our public schools were wretchedly poor. But to find it to be universally the case, go back to the time the normal schools were established, and then we will recognize the fact that our public schools were wretchedly bad. The majority of the public school teachers who went into the country schools were not qualified for the work. At last the normal schools were established. Just what they were established for seems to be a question. We all say there are too few teachers for our public schools. After one normal school was established a long time intervened before another was established. No one could be so foolish as to say one normal school could supply our schools with good teachers. After its establishment good teachers were turned out and bad teachers were turned out, and went out through the State. We have them in all parts of the State. In the county that I represent we have more than our proportion, being more than 150 miles from any normal school. Yet we prize normal graduates highly. Some are good for nothing. But we are glad to admit that our normal schools have done noble work. There are but eight normal schools in the State. How far does that go to supply thirty thousand teachers for the State? We have from four thousand to six thousand beginners every year. Where are they coming from? The public demand that something shall be done in the work of the normal schools. The public demand better qualifications. Teachers' classes have been organized in the academies of the State, and yet no qualifications were demanded of those that went in there, simply his training in the high school. They had received no instruction in the theory and practice of teaching, and were graduating simply high school scholars. But they did a certain work. And yet the people were not satisfied. They never have been and they never will be with that kind of teaching. It relies on the public schools to keep up with public sentiment, and the inspector's point I believe, that the public school system took a long step in advance, a long step in the right direction, by demanding first, certain qualifications; second, demanding in graduating at the end of the term certain qualifications; just what these are it is to be determined. We have had a class in our county under the direction of the Regents, which we believe to be just this, that all examinations were in methods of teaching. We were instructed to give them twenty questions, and expect them to answer correctly, as I suppose, the Regents intended, making the test 90 out of 120 on school economy. We believe we have worked well, and raised the standard of teaching. We have waived much to supply that, and yet looking the

matter over, as I said, there are less than one hundred classes, supposing each to have 15 in a class. We are not yet supplied. Thousands of teachers yet must come from some other source. There are thousands of school districts in the State who cannot afford to pay normal school teachers or good teachers. I believe that no one should be allowed to teach in any part of our State who does not hold at least a Regents' preliminary certificate. If that were the test there would be more than 5,000 who could not pass that examination. It is too bad. It is a shame, but the facts are before us. I believe normal schools are doing good work as far as they can go. I would have more normal schools — not less than twenty-five in the State. I believe that they should have one teachers' class in each commissioner district to fit teachers for teaching, and to give them more theory and practice. The time is coming, ladies and gentlemen, when the person who comes out from the academy or high school must be fit to teach a child. The public recognizes that fact. It is abominable that persons who undertake the most difficult task, one of the labors requiring the best qualifications, should make the attempt while totally unfit. I believe we should have during the summer a teachers' institute from four to six weeks, during the summer vacation, for the benefit of those teachers who are now in the ranks, who want to know more of methods. We should have at least, in the State of New York, equipped and furnished with the best talent to teach these older teachers who cannot go to the normal schools, and those normal graduates who have taught forty or fifty years, and perhaps have forgotten something about the methods of teaching, if they ever knew it.

Principal HILL — I am opposed to teachers' classes, first, because it belongs to normal schools or teachers' institutes so far as it is academic, several classes are not necessary, as required by the Regents. I have some sympathy for the students or scholars in the country schools, and I do not wish to have them taught methods by that class of teachers whom we have had the pleasure of hearing are still ignorant. We are told that the teachers in academies not instructed in the normal school methods stated are not competent to teach, and it did not seem to me right for them to impair the professional instruction of those teaching the country schools. Second, because under the conditions imposed by the Regents we cannot do the work of teachers' classes well without employing extra teachers. Teachers' classes in academies cannot do their work well without employing extra teachers, and they cannot employ extra teachers without incurring extra expense, more than that received from the State. Third, I believe that nine-tenths of those who apply for admission to the teachers' classes are abundantly able to pay their tuition. Why is it that the country schools do not have teachers well prepared for their work? Is it because there are not enough boys and girls, young men and young women in the country who are competent to teach? Not at all. The real cause is that these schools do not pay wages enough to bring into them a class of teachers that are com-

petent for the work, and I am certain that if the State were to turn its attention to some way whereby the teachers in the country schools could be paid an adequate compensation, that they would have a sufficient number of teachers, and they would not be compelled to have teachers' classes in the academies; for I am of that unfortunate number who believe that there are teachers who are not educated in normal schools. The whole system received quite a check at Saratoga from one of the teachers who admitted that there was no science of teaching that had yet been reached; that there are not a few persons, and these few persons, let me tell you, are people who put teachers in academies. They were not educated in normal schools, still they have methods of instruction. They do not formulate them, but still they do very good work in many instances. Fourth, because those eligible to classes under the provision of the Regents do not wish, nor would it be profitable for them, to pursue a prescribed course of study. For these reasons, among others, I am opposed to establishing teachers' classes in academies.

Principal HOWARD — Mr. Chairman: It gives me pleasure to say a word in regard to teachers' classes; it gives me pleasure to speak about them because of the good they do; it gives me pleasure to speak of them because our teachers have to go out and teach, and they are a great advantage to the boys and girls of the district, and just introduce them to their subjects and send them into our academies, to our high schools and union free schools, perhaps take hold of them and then start them on to their colleges. I know that it is a fact, and I am pleased to say that I had a class last fall, a year ago. Prof. Watkins came upon me and surprised me, and my pupils. I thought they would lose their heads, but they were delighted, and so was I. And these young men and these young ladies went out, and they said to me, "How much the instruction in that class helped me in my work." And I know especially one young man who came to the school and said I think I must know about these matters, and he came back a changed man, and he said, "I wish a thorough education. I see where I am deficient. I see in what I am lacking. Now next fall examine me as you please, find out my deficiency, and I may go back again, and put me just where I belong, because I will take a course of study. I never thought of it before." Now I do not wish my friends to start up any antagonism in regard to the question which has been discussed here. Now, I have been in a normal school, and I have taught; I know what the instruction is there. We have a school about fifty miles from me, — the Massena Springs, you may have heard of it — the Potsdam Normal School. We must now encourage the children to come to school, have them take the primary course and pass on to the next by and by. Soon we are confronted by the skeleton, which is the Regents' questions, and it gives me pleasure to say, also, ladies and gentlemen, that the work which these teachers are doing there is excellent. They have got to be the feeders of the high school. Perhaps I am mistaken, but I think they are. They go out and teach

thoroughly as well as they know how. They bring back scholars to your school, and once give them a taste of the pleasures of education, once they are on the road, you cannot switch them off. I would say, furthermore, encourage if you please, encourage every one of you, every boy and girl who wishes to get an education. Do not tell them they do not know enough to go to college, but encourage them. I have had boys and girls in my room that would cry again and again, and wish to be excused from certain subjects; they would say of their task, "I cannot get it." Encourage them, show to them and explain to them. We have dull boys and dull girls. Encourage all those boys and girls, especially those who are unable to pay their tuition. These teachers' classes are doing a great work. Do you ever go into the normal schools and see the work that is being done there? If you have not, go. In all the districts in our vicinity they are looking for teachers who have been instructed — they are looking for pupils from normal schools. The work is progressing in St. Lawrence county.

Principal VERRILL — I did not know, sir, that we were expected to discuss as to whether it would be advisable to have teachers' classes in our public schools. I supposed that point would be admitted by all. I was not prepared to hear any one come in here this afternoon and oppose this. It has been suggested that there was a lively discussion here this forenoon. I am very glad indeed that we did have a lively discussion. It will do no harm if we get excited on this subject. We can get excited on the subject of education as well as politicians can get excited over their subjects. In answer to the gentleman from Schuyler county I wish to say a word. He says he is not in favor of teachers' classes. I say first, I am in favor of teachers' classes in the academies of this State. I am in favor of it because I see no other way in which there can be preparation for the work in the common schools. There are a few normal school graduates in the county which I represent — Delaware county — and so far as I know every one of them has made a good teacher. There are not many of them. They would not supply many schools. I am in favor of teachers' classes in academies. I can see no other way in which the teachers can be secured that are needed. Secondly, he says "the work cannot be done in academies." I suppose he means as well as it ought to be. How much we might best use this item or that of knowledge we would better know, I believe, if that when we examine ourselves we might more clearly see our own defects. At least I am one who sees his own defects, or at least more clearly as the years go by. But to say that the work cannot be done, I do not know what he means, unless not as well as it ought to be done. We certainly can take up something in the line of methods of instruction. There is no one here so foolish as to believe that there are no general principles in regard to teaching any one branch. We would all concur so far as the methods are concerned in the teaching of arithmetic. We might not agree in all the details, but we would agree in regard to the fixed

principles; and I will go back to myself, a boy of seventeen years of age, beginning to teach a district school. I know it would have been a great help to me if I had instruction in teachers' classes; it would have been a great benefit to me. The third point to which I will refer is in regard to nine-tenths of those applying for admission to teachers' classes being abundantly able to pay their own tuition. Now if we discuss this question we shall naturally have reference to our own schools. I say emphatically that it is not true with reference to the school I have been in for the last several years. On the other hand, nine-tenths are not able. It may be said that the trustees are not paying the teachers what they ought to pay them in the districts. To be sure they are not. Can we get at that any better than to prepare these teachers so they will demand better pay? We cannot control the trustees of the schools, we cannot say how great wages they shall pay. I have heard of the young girl who taught for $1 a week and board around. I am inclined to think the teacher did not really earn the money. Nine-tenths are not able to pay their own tuition. The gentleman, if I understand him correctly, the gentleman from Schuyler county who spoke, must have introduced a little sarcasm, because he said those teaching in academies did not know any thing about the science of teaching, and then before closing his remarks says they do know something about it. Many of us here have the courage to believe, and faith enough in ourselves to believe that we do know a little something about it, and we seek for more knowledge, and we will do good work if we have a chance to do it. Just a word and I close. I respect Dr. Watkins and his work. I would have been glad to receive him in my school. The effect has not been so good as we expected; has not brought in such a good class. The reason is this: the young men and young women cannot get certificates. They are obliged to run the risk of not holding a teacher's certificate; they know if they do not pass the required examination they will be obliged to pay their tuition. Many do not come into the school at all. They say we can get certificates of school commissioners. In many instances this is working a very bad effect with us. They can obtain certificates for teaching school with very slight qualifications, so slight that it is one of the wonders of the day that they can convince school commissioners that they are in possession of any knowledge whatever on some subjects. The result has been that we have not had so good classes. I have taught in one normal school twenty years, and have had some opportunity to know about that normal school at least. I felt the necessity when I entered the school where I am, I felt the necessity of doing something in instructing pupils in methods of instruction, instructing them as how to teach arithmetic and in the special subjects taught in the common schools. Instructing them how to teach geography, spelling, reading, etc., etc. There are districts where a teacher must be very skillful if he can even convince that it is worth while to attempt education in any method in any case whatever. There are some hindrances in the

way of education. Some things are not as easy to get as heretofore. We are not able to take up school economy as we do with the other classes. We are losing students in our schools on account of the change, simply because the students say, "we can obtain our certificates any way, and we will not run any risk."

Principal FARR — In regard to these teachers' classes, I want to say that as far as my experience goes since Dr. Watkins took hold of these classes there have not been any more farces in regard to them. I think that the teachers in this State know Dr. Watkins too well to expect any more farces in the immediate present, with reference to the work. Perhaps if there were normal schools enough to give the good professional instruction necessary, we might dispense with the teachers' classes in the schools. But it is admitted on the other hand we cannot expect that this will be done. Besides encouraging the instruction of common school teachers in the academies, it is the policy of the State to do more. I know it was one of the pet theories of our late Superintendent of Public Instruction, to establish, at least, one department in every county or commissioner district, which should be employed by the State to give professional instruction in methods, and paying for that instruction liberally enough so that they could be at liberty to employ special instructors. If that could be done, it seems to me it would be one of the grandest things ever done in this State. Let us come as near to it as possible. As Dr. Watkins suggests in his report, let us have two terms a year, and let us do in these terms as much professional work as is possible, and is it not true that if teachers have the ability to teach successfully an academy or a public school of good standing, why cannot they give those that are perfecting themselves an opportunity to teach more ideas, and so better enable them to do the work which they come forth to do than they otherwise would do. Now the question is just this: whether they shall have that instruction that the teachers' classes have been giving them or whether they shall not have any. But just one word in regard to the question of examining these classes. I shall rejoice to see, and I think all concerned in the question of these teachers' classes will rejoice to see it, as the other departments are under the control of the Regents, and have that department arrange and conduct the examinations on the same principle that they do in the other departments. Make them rigid, lay them out definitely as does the excellent syllabus published by Dr. Murray, outlining the subjects clearly. Let teachers understand what they are expected to do, and then hold teachers and classes responsible for a certain amount of work. I can hardly understand how this system has worked in such a way as to diminish the excellence of the material composing the classes. They are required to pass a Regents' preliminary examination in these subjects; a certain amount of definite knowledge is required. Under the old system we all admit that numberless scholars were admitted to these classes who never did nor could pass that examination, and never have given or attempted

to give professional training. They are now required to have definite knowledge in these subjects which is supplemented with a knowledge as to the best methods of teaching these particular branches.

Professor LOVELL — I am in favor of teachers' classes in academies. I believe in the theory, and I will tell you why. In the first place, the normal schools of the State of New York graduate in each year a certain number of students, and they are taken up as fast as they can be graduated from these schools by the union schools and academies throughout the State. Applications are coming in to normal school faculties for the last three or four months before the school is to be graduated each term from the boards of education saying, "we want a good man or we want a good woman for such a place." I know how this comes. My board of education takes that way. It sends to the normal school faculties to supply places in the department. The normal school graduates are taken out. There must be teachers for the country schools. If classes can be instituted in the academies which can supply teachers for the country schools, let us have them, and let the State support them grandly and nobly. I am glad to see teachers' classes receiving testimonials which are very readily made certificates by our teachers. Lawyers are admitted to the bar by lawyers, clergymen or candidates for the clergy are licensed by clergymen, doctors are examined by physicians, but school teachers have been examined by this man, that man and the other man around the State of New York who, by some political hook or crook, had been elected school commissioner. The time has come, and I see the dawn of it in the teachers' classes in academies, when teachers will be examined by teachers. I believe in teachers' classes.

Principal WILLIAMS — I do not know but I ought to call attention to the fact that there are two other papers set for this afternoon's discussion, and the first one of the two papers, at least, should have some chance for careful consideration. It is in relation to the selection of books for academy libraries. It is a special paper prepared at the request of the Regents of the University, and it is intended to be sent out as an instructive paper to the academies of the State. I would like to suggest, therefore, to the convocation, Mr. Chairman, although this discussion is a very important one, of suspending it until we have heard the other two papers.

Professor WILSON — I wish to make a motion. We all listened to Prof. Gilmore's paper, and we all appreciated it very highly, and the very great care, pains and labor he has bestowed upon it. We are all under great obligations to him. I understand, however, that the Regents are about to publish that report and circulate it throughout the State to the various educational institutions. As I understand it, the best means of carrying out his wishes is that it be referred to a committee, to consider and modify, perhaps, if need be, the lists of books that are included. I have nothing, from what I have heard, to say in adverse criticism; nothing to strike out; but

perhaps there are gentlemen even more familiar with books and literature than the professor himself. I think it may well be referred to a committee appointed to consider these lists before publication. I, therefore, move it be referred to a committee of not less than five, and I think, in this case, as large a committee as may be — five or seven.

ACADEMY LIBRARIES.

By Prof. J. H. GILMORE, of the University of Rochester.

Among all the accessories of an academy or a high school, there is none which is of greater importance — none which should excite greater interest — than its library. Yet the library of most of our secondary schools is a disappointment, if nothing worse. It has cost a great deal of money; and it has not, to any sane mind, paid for itself either in instruction or amusement. It is the purpose of the Board of Regents to furnish such suggestions as may tend to elevate the school library to the position which it should occupy in our educational system.

THE OBJECT OF THE SCHOOL LIBRARY.

The school library should, it is thought, contemplate three somewhat different but closely related purposes, which are mentioned in the order of their relative importance.

1. To furnish both teachers and scholars with such *books of reference* as may be essential to the thorough comprehension of the studies pursued in the school. It is for this object, in the first instance, that school libraries exist; and, in the purchase of books for school libraries, the preference should invariably be given to such books as are needed to explain or illustrate the routine work of the school.

2. To facilitate an extension of the regular course of study by furnishing material for judicious *courses of reading*. The brighter pupils in a school should have more work put upon them, or at ar rate should be encouraged to undertake more work than those pupils who are less gifted. A well-selected library will furnish such pupils with abundant opportunities for work, than which none could be more attractive or more helpful. But even the stupidest scholar will need, in the preparation of essays and orations, books of a more generous and less utilitarian scope than those which are ordinarily called "books of reference."

3. To furnish *healthful recreation* to students — and, indeed, to the entire community in which the school is planted. The nineteenth century boy or girl might not, inaptly, be defined as a reading animal; and, like every other animal, its character is largely determined by the food which it assimilates. Bad books are freely offered to the pupils in our schools and eagerly devoured by them. The name of such books is legion and they can be bought for the merest trifle. The best way to crowd such books out is by supplying our pupils with books which are thoroughly interesting, yet devoid of all immoral tendencies and unhealthful suggestions. Innocent amusement — and not merely instruction — is, then, one object for which the school library legitimately exists. In proportion as it attains to this end, is it likely to become a blessing to all the pupils in any given school. Just here, too, is the school library most likely to enlist the sympathies, and secure the benefactions of the com-

munity in which it is planted, and ultimately blossom out into the village library, or the town library, with more and better books of reference and material for wider courses of reading than, as a mere school library, it could ordinarily command. The way to increase the scanty funds at the disposal of a school for the replenishment of its library is to make the library indispensable to the school and attractive to the entire community. Then a subscription list for the increase of the library will be welcomed with joy, and entertainments to raise money for the library will plan themselves.

It should be distinctly understood that the devil has no monopoly of the interesting books — that "good books" and "dull books" are *not* necessarily convertible terms. Every school library of any considerable size should abundantly illustrate this fact. It should contain no bad books, no books that are of questionable tendency even; but it should — and easily may — abound in books which will prove thoroughly attractive to boys and girls (or men and women) who have any taste for reading at all.

QUESTIONS OFTEN ASKED.

Most principals of our academies or high schools recognize, with greater or less distinctness, these three legitimate functions of the school library; but it is with many of them a serious question just how the school library is to attain the ends for which it exists.

What books shall we buy for our library, is a question on which they often take counsel; and, by this question, they mean not what class of books, but what specific volumes. Indeed the question often takes these forms: "Which is the best English dictionary?" "Which is the best encyclopædia?" "Which is the best history of the United States."

What edition shall we buy of authors whose works are clearly indispensable, is a question hardly less frequently submitted to those who are supposed to have, with reference to special departments of literature, wider experience than the over-worked, and all-worked, academy teacher can possibly attain.

Where and how shall we buy books, is a question not so often asked, but a question hardly less significant, as will presently be seen.

THE IMPORTANCE OF THESE QUESTIONS

can hardly be over-rated. There has never been a time when a little money judiciously expended would go so far in the purchase of a good working library — an attractive reading library, as in this era of cheap editions, instructive compends and labor-saving appliances of various kinds. On the other hand, there never was a time — so many are the books thrust upon us, and so various are their degrees of excellence — when it was so easy to expend a very considerable sum of money in the purchase of books, and still have very little of substantial value to show for it.

We are likely to err in the purchase of books which still enjoy a

reputation that they once deserved — books once good but now supplanted by books a good deal better; in the purchase of complete sets where we really need only single volumes; in the purchase of expensive treatises where cheap compends would serve our turn quite as well; in paying money for costly bindings; in buying two books of attested worth, when one book — of whose existence we do not happen to know — covers the same ground as both these volumes, and at half the price; in purchasing costly editions when equally serviceable cheap editions are available, etc., etc.

THE OBJECT OF THIS PAPER.

To reduce to a minimum such blunders as we have mentioned, it is proposed to give some suggestions with reference to the purchase of books for academies and high schools, which have little money to expend for this purpose and wish to make every dollar tell.

General suggestions will first be given, pointing out more specifically than we have yet done, the mistakes into which those purchasing books for school libraries are likely to fall. More minute and specific instructions with reference to the purchase of books will follow. The best books, in various departments, for the library of an academy or a high school (*not a college*), will be indicated and an academy or high school of somewhat scanty means (as most of our New York academies unfortunately are) will be had in mind. In these latter recommendations, the compiler of this paper has availed himself of the suggestions of specialists in various departments of study. But he has *not* consulted publishers, nor has any publisher known that any such paper was in preparation.

GENERAL SUGGESTIONS ABOUT BOOK BUYING.

1. Buy no book unless, by personal acquaintance with it, or competent and trustworthy testimony, you *know* that it is worth adding to your school library. A favorable book notice does not always afford such testimony. Some of these favorable notices are kindly furnished by the publishers; some are written to reciprocate advertising favors; others, though not inspired by cupidity, are dictated by ignorance. It is our purpose in this paper to give candid and unprejudiced advice respecting volumes enough to form a very decent library. Seek such advice respecting other books from persons in whose judgment you have entire confidence.

2. Do not feel that you must buy complete sets of an author. We wish every school library in the land might have a complete set of Irving and a complete set of Hawthorne; but it is better to have *some* of Irving and *some* of Hawthorne than a complete set of the works of only one of these authors. Remember that in the case of many standard authors an incomplete set can be completed as opportunity arises or occasion requires. Look at a complete set of De Quincey on the shelves of any public library, and see how many of the volumes show signs of wear. *Those* are the volumes for you to buy.

3. Never — in buying books for the average academy — spend a penny on fine bindings or attractive illustrations. Nor would we advise spending money on *substantial* bindings. The muslin in which books are ordinarily bound may last for years; and, when it fails you, the book can be rebound in half-leather for less than the difference in price, at the book stores, between the cloth-bound copy and the leather-bound copy.

4. Look out for American editions of English books. If the book is really valuable, such editions are pretty sure to come at an early day and at a greatly reduced price.

5. Look out for second-hand copies of costly works; but do not trust too much to the second-hand dealer. His wares are often defective. If possible, inspect them yourself, or get a friend to do so for you, before you buy.

6. Do not buy of a book peddler. In nine cases out of ten you can find better and cheaper books, on any subject, at the stores. *Never* subscribe for a book which is to appear in parts. You can seldom be sure what it will cost you; nor are you any more certain that the work, when complete, will at all correspond in merit to the specimen shown you. Nay, you have no certainty that the work will ever *be* complete. This mode of book buying is too expensive a luxury for poor academies to indulge in.

7. Buy your books of a reputable dealer, and of the same dealer year after year, unless you catch him cheating you. But do not surrender your judgment to his. Do not let him select books for you. There are few persons more ignorant of the *inside* of books than the average bookseller; and then he is under constant temptation to work off, upon a too confiding customer, dead stock, or books on which he will realize an especially large profit. Know what you want when you go to a bookstore. Know the retail price of the books that you wish to purchase — a fact which it will not be difficult to ascertain. Understand that if you are buying books for a school, any bookseller should give you twenty per cent discount from the retail price on small purchases; and that, if you are buying one hundred dollars' worth of books and pay cash, a discount of twenty-five per cent is none too liberal. It is good economy to keep a list of the books that you want, let your funds accumulate and buy at wholesale rates once or twice a year.

SPECIFIC RECOMMENDATIONS WITH REFERENCE TO BOOK BUYING.

We proceed to give more specific suggestions with reference to the purchase of books, mentioning, under several distinct heads, those works which seem best worthy to find a place in the library of an academy or high school. Pains is taken to give the exact title and *the retail price* of each book named. Unless the book is perfectly familiar to the trade, the name of the publisher is added; and the name of the publisher is uniformly given, where it is necessary to discriminate between different editions of standard authors. Any

bookseller ought to be able to procure for you any book mentioned in these pages, and that promptly and at a less price than that named. Or, any publisher will cheerfully send you his books at the retail price.

THE ENGLISH LANGUAGE AND LITERATURE.

A prime *desideratum* here is, of course, a good dictionary, and the best dictionary (all things considered) is *Webster's Unabridged* (price $12). Worcester's Dictionary was formerly regarded (and is by some still regarded) as better authority with reference to spelling and pronunciation than Webster's, but in other respects Webster's is the better of the two. A school library should, if possible, contain both these dictionaries. In purchasing, be sure to get an edition not earlier than that of 1881, as the later editions of both Webster and Worcester contain a valuable supplement of additional words and definitions. And be sure to know what your Webster *does* contain. The matter in the introduction and appendixes is very valuable, including, among other things, the substance of Wheeler's "Noted Names of Fiction."

Webster is very good on the composition and derivation of words, but may well be supplemented in this direction by *Skeat's Concise Etymological Dictionary of the English Language*, just published by Harper & Brothers (price $2). *Soule & Wheeler's Manual of English Pronunciation and Spelling* (price $2) is a very handy book, and there is no better American authority on the subjects of which it treats. The new edition of *Crabb's English Synonyms*, published by Harper & Brothers (price $2.50), is, on the whole, the most satisfactory work of that kind which is available. *Roget's Thesaurus of English Words and Phrases* (price $2) is admirable to remind a person of words which he does not at the moment recall, but whose meaning he clearly apprehends. Its usefulness is marred, however, by its making no attempt to discriminate shades of meaning.

As a book of reference on questions of English Grammar, we would recommend *Angus's Hand-Book of the English Tongue* (London: Religious Tract Society, price $2), if but one book can be had. The following volumes would, however, be invaluable to a teacher of English, and some of them would prove attractive to his pupils:

Morris' Outlines of English Accidence (Macmillan & Co., $1.75).
Abbott & Seeley's English Lessons for English People (Roberts Brothers, $1.50).
Abbott's How to Tell the Parts of Speech (Roberts Brothers, $1).
Abbott's How to Parse (Roberts Brothers, $1).
Abbott's How to Write Clearly (Roberts Brothers, 60 cents).
Abbott's Shakespearian Grammar (Macmillan & Co., $1.50 cents).
Trench on the Study of Words, $1.
Grant White's Words and Their Uses, $2.
A. S. Hill's Principles of Rhetoric (Harper & Brothers, $1.25).

Bartlett's Familiar Quotations, price three dollars, is decidedly the best book of its class. It is not a volume of elegant extracts, but it is designed to aid one in tracing a quotation which he meets to its author, and in rectifying any possible blunder on the part of the quoter. Be sure to get a recent edition, as the book is steadily increasing in size and value.

Chambers' Cyclopædia of English Literature is simply indispensable to every library, and will save the buying of all collections of "elegant extracts" and the works of many separate authors. We decidedly recommend the latest English edition, which may be had for six dollars. Every American will want something to supplement *Chambers'* and *Hart's American Literature* (Philadelphia: Eldridge & Brother, $2.25) is the most serviceable book in this direction with which we are acquainted.

In histories of English literature one has an almost infinite variety of books from which to choose. For an academy library we can especially recommend:

Stopford Brooke's Primer of English Literature. (Appletons, 50 cents.)

Collier's History of English Literature. (London: T. Nelson & Sons, $1.75.)

Morley's First Sketch of English Literature. (Cassell, Petter & Galpin, $2.)

These books vary in character, and each will prove attractive to a different class of minds; but they are all symmetrical, trustworthy and suggestive. Quite as suggestive — but neither symmetrical nor altogether trustworthy — is *Taine's English Literature;* and we would recommend the work of that brilliant but erratic Frenchman, for the use of such students as we now have in mind, in Fiske's Abridgement (Henry Holt, $2.50), if at all.

The books which we recommend may be supplemented by others which specially discuss distinct periods in our literary history, or single authors, among which the most useful, for our present purpose, are:

Marsh's Origin and History of the English Language, $3.

E. P. Whipple's Literature of the Age of Elizabeth, $1.50.

Grant White's Life and Genius of Shakspere, $2.

Thackeray's English Humorists. (See under Fiction.)

Mrs. Oliphant's Literary History of England during the 18th and 19th Century, 3 vols. $3.

Masson's Recent British Novelists, $1.25.

Shairp's Studies in Poetry and Philosophy, $1.50.

Shairp's Aspects of Poetry, $1.50.

Leslie Stephen's Hours in a Library, $1.50.

Henry Reed's Lectures on English Literature (Claxton), $1.75.

Peter Bayne's Lessons from My Masters, $1.50.

Stedman's Victorian Poets, $2.

Field's Yesterdays with Authors, $2.

Adams' Famous Books (Worthington, $1.50).

Guernsey's Thomas Carlyle (Appleton's), 60 cents.

The English Men of Letters Series on Burns, Byron, Milton, Shelley, Chaucer, Cowper, Pope, Southey, Bunyan, Spencer, Locke, Wordsworth, Burke, Gibbon, Home, Johnson, De Foe, Goldsmith, Scott, Thackeray and other authors.

This admirable series is reprinted in this country by Messrs. Harper & Brothers for seventy-five cents a volume — each volume covering one author; but the twenty authors named above are included in five neat volumes, published by John W. Lovell of New York, which may be had for two dollars and fifty cents.

In the direction of books illustrative of American Literature there is little to recommend. *The American Men of Letters Series*, published by Houghton, Mifflin & Co., at one dollar and twenty five cents a volume, already includes biographical and critical estimates of Irving, Noah Webster, Thoreau, George Ripley and Cooper. The volumes on *Irving* and *Cooper*, at least, should find a place in every school library; and teachers would do well to keep an eye on this series. The same firm publishes *Lathrop's Study of Hawthorne*, price one dollar and twenty-five cents, which is the best book on Hawthorne yet published. Something similar might be said of *Symington's Bryant*, republished by Harper & Brothers for one dollar.

It is not our purpose to include, in this list of books, religious or devotional works; but a copy of the Bible is an indispensable adjunct to the study of English literature; and *The annotated Paragraph Bible* (Sheldon & Co., $6) is the very best edition for school use. It is correctly printed; briefly, but admirably annotated, and supplied with maps and other extraneous matter, which add greatly to its value. This edition is of English origin and entirely undenominational in its character. To facilitate its use, especially in verifying quotations and allusions, every school should be supplied with *Young's Analytical Concordance.* (Funk & Wagnall, $2.50.) *Smith's Concise Dictionary of the Bible* (price $4.50) will, perhaps, be desired by some schools; and every school should have the *Authorized Version and the Revised Version of the New Testament* in parallel columns, as issued from the Oxford press, for one dollar and fifty cents; or these parallel versions, with the Greek text of Schrivener added, as issued from the Cambridge press for four dollars.

GREEK AND LATIN LITERATURE.

Under this head we would recommend *Smith's Classical Dictionary of Biography, Mythology and Geography* (price $6) as best adapted to the wants of most schools; though we wish every school might own the five portly volumes of which this single volume is a condensation. *Anthon's Classical Dictionary* (Harpers, $5) is, however, founded upon that of Smith; and some teachers regard it as preferable to its English prototype. *Smith's Dictionary of Greek and Roman Antiquities* (price $8 in the English edition, or

$5 as reproduced by the Harpers) we regard as indispensable to the library of such a school as we have in mind; and it may well be supplemented by *Guhl & Koner's Life of the Greeks and Romans* (Appletons, $5), which takes the place long filled by Becker's *Gallus* and Becker's *Charicles*. The latter books are still serviceable, however, though a little heavy; and so is another of the old books, *Fiske's Eschenberg's Manual* (price $4.50), which many classical teachers still regard as an absolute *vade mecum*. Our school library should certainly contain *Mahaffy's Old Greek Life*, published by the Appletons, for only fifty cents.

Among classical atlases, we should choose between that of *Kiepert* ($3), and that of *Ginn & Heath* ($1.75).

Murray's Manual of Mythology (Scribners, $2.25) is perhaps, as serviceable as any of the numerous treatises on that subject; though the latest edition of *Bulfinch's Age of Fable*, revised by Edward Everett Hale, presents the old classical myths in most attractive form, and may well supplement the volume to which we have just referred. It costs three dollars; but is richly worth the price put on it.

Of Latin literature, the best history is, perhaps, that of *Crutwell* (Scribners, $2.50), which will find a fitting complement in *Mahaffy's History of Classical Greek Literature* (Harpers, 2 vols., $4). In this connection *Jebb's Primer of Greek Literature*, published by the Appletons, at fifty cents, should by no means be overlooked. It is an admirable compend, and may be all that some schools need or can afford. The series of *Ancient Classics for English Readers* (covering the principal authors of Greece and Rome, in twenty attractive volumes at one dollar a-piece), will help to put students who do not take Greek and Latin on a level with those who are pursuing "the classical course." A similar service will be rendered by Green's series of *Classical Writers* (Appletons, 60 cents each), which already includes Euripides, Virgil, Sophocles, Livy and Demosthenes — the latter being exceptionally good. Prof. Wilkinson's *Preparatory Greek Course in English* and his *Preparatory Latin Course in English* (Phillips & Hunt, price $1.25 each), will, also, be very serviceable in this direction. The school library should contain, however, free translations, of accepted excellence, of the works of the best Greek and Latin authors. We recommend, as typifying the class of books which we intend:

Bryant's Iliad, $3.50.

Conington's Æneid (Widdleton, $2.25).

Butcher & Lang's Odyssey (Macmillan, $1.50).

Theodore Martin's Horace.

Church & Brodribb's Agricola and Germania (Macmillan, $1.50).

It would be well to include in our school library a few such monographs as *Middleton's Life and Letters of Cicero* (Nimmo's edition, $2, is the best and cheapest); *Froude's Cæsar* (Harpers, 60 cents); and *Trollope's Cicero* (Harpers, 2 vols., $3); and we would also recommend, as useful in various directions, *Clough's Plutarch's*

Lives (3 vols., $6). *Gladstone's Homer Primer* (Appletons, 50 cents) is also a *desideratum*, and would, perhaps, be more useful to such scholars as we have in mind, than his *Juventus Mundi.*

Of course our school library will include the latest edition of *Andrews' Latin Lexicon* (Harpers, $10), and the seventh edition of *Liddell & Scott's Greek Lexicon* (Harpers, $10). We would also recommend *Autenreith's Homeric Lexicon* (Harpers, $1.10); and, for purposes of reference, *Madvig's Latin Grammar* (Ginn, Heath & Co., $2.50); *Goodwin's Greek Moods and Tenses* (Ginn, Heath & Co., $1.50) and *Madvig's Greek Syntax. Parkhurst's Latin Verb Allied to the Sanskrit* (Ginn, Heath & Co., 50 cents), and *Nettleship's Suggestions Introductory to a Study of the Æneid* (Macmillan, 75 cents), will also be found very useful.

MODERN LITERATURES OTHER THAN ENGLISH.

Under this head we shall — bearing in mind the specific purpose of our recommendations — name but few books. A good History of German Literature is, however, to be desired in every school library, and that of *Hosmer* (Jones & Co., St. Louis, $2.00) is, on the whole, the best; though *Bayard Taylor's Studies in German Literature* (Putnams, $2.00), should by no means be overlooked; and *Madame De Stael's Germany* (H. M. & Co., $2.25) is very bright and suggestive in this direction. *Saintsbury's Short History of French Literature* (Clarendon press, $2.50), leaves little to be desired in the sphere which it covers; but we may, perhaps, be excused for mentioning *Brachet's Historical French Grammar* (Macmillan, 75 cents) and *Brachet's Etymological French Dictionary* (Clarendon press, $2.50), as exceptionally well fitted to promote that knowledge of a language, without which a thorough acquaintance with its literature is impossible.

We know of no thoroughly good translations of the French classic authors; and suppose that most students, even in our academies and high schools, would read them in the original, if at all. Of *Goethe's Faust*, the best translation is, on the whole, that of Bayard Taylor (1 vol., $3); of *Dante's Divine Comedy*, the best translation is, indisputably, that of Longfellow (1 vol., $3); with which, however, one should associate, with reference to the period and the man, *Botta's Dante* (Scribners, $2.50).

Botta's Handbook of Universal Literature (Osgood, $2.50) is the best book of its kind for general use; and *Longfellow's Poets and Poetry of Europe*, abounding in illustrative specimens and brief critical estimates, is fairly indispensable to any well selected library. Be sure to get the latest edition of this work, which has recently been enlarged, revised and reduced in price to five dollars. We would also advise the purchase of *Sismondi's Literature of the South of Europe* (Bohn, 2 vols.).

Attention should, in this connection, be called to the series of *Foreign Classics for English Readers*, of which fifteen volumes have been republished by J. B. Lippincott & Co. at one dollar per vol-

ume. These books vary considerably in excellence; and taken as a whole, are not quite what they should be; but the niche which they occupy is not — so far as we are informed — otherwise filled.

The mediæval literature of Europe — and especially of the north of Europe — should not be unrepresented in our school library, although it will hardly need extensive representation. We would recommend *The Great Epics of Mediæval Germany*, by Dippold (Roberts Brothers, $1.50); *Anderson's Norse Mythology* (Griggs, $2.50); *Echoes from Mistland*, Auber Forestier's charming paraphrase of the Nibelungen Lied (Griggs, $1.50), and William Morris's *Sigurd the Volsung* (Roberts Brothers, $2.50).

HISTORY.

Passing to the domain of history, the best general treatise — whether for class-room use or as a book of reference — is *Swinton's Outlines of the World's History* (Ivison, $2). This book will be adequately supplemented, so far as the remote past is concerned, by *Rawlinson's Manual of Ancient History* (Harpers, $2.50); though the *Student's Ancient History of the East* (Harpers, $1.25), should by no means be overlooked. The Society for the Diffusion of Useful Knowledge publish, under the title of "Ancient Histories from the Monuments," a series of monographs on Babylonia, Assyria, Persia, Egypt, Mt. Sinai and the Ancient Cities of Asia Minor, which will be very useful if they can be obtained; but we are informed that they are now out of print.

The best brief manual of Greek History is *R. F. Pennell's History of Ancient Greece* (Allyn, 75 cents); and next to this, in point of utility, is *Smith's History of Greece* (Harpers, $1.25). Though not deserving the highest praise for originality, *Timayenis' History of Greece* (Appletons, 2 vols., $2.50), will be useful, as it covers both ancient and modern times. Curtius' admirable history is pretty dry reading for a novice, and if any thing more than has been named is desirable, we should recommend *Grote's History of Greece* (Harpers, 12 vols., $18); though Grote must be read with the understanding that he systematically glorifies republican institutions.

Leighton's Rome (Clark & Maynard, $1.20) is the best brief history of the all-conquering people of whom it treats, and this will be adequately supplemented by *Mommsen's Rome* (Scribners, 4 vols., $8); though *Lord's Old Roman World* (Scribners, $3), would be useful in every school library; and so, perhaps, would *Gibbon's Decline and Fall* (Harpers, 6 vols., $3), though some might be satisfied with Gibbon as abridged in the Harpers' "Student's Series" (price $1.25), in which form we should certainly recommend *Hallam's History of the Middle Ages* (Harpers, $1.25). To bring the student intelligently down to modern times, he should have access to the first volume of *Guizot's History of Civilization* (Appletons, $1.50), and also to *Bryce's Holy Roman Empire* (Macmillan, $3). *White's Eighteen Christian Centuries* (Appletons, $2), is likewise a book which no school library will make a mistake in buying.

Hausser's Period of the Reformation (Carters, $2.50), is decidedly the best book on the subject of which it treats.

With the books already mentioned, we may well associate the monographs, reprinted by the Scribners (price $1 per volume), under the title of "*The Epochs of Ancient History Series.*" This series already includes: "The Greeks and the Persians;" "The Athenian Empire;" "The Macedonian Empire;" "Early Rome;" "The Gracchi, Marius and Sulla;" "The Roman Triumvirates;" "The Early Empire;" "The Age of the Antonines;" "Troy;" "Rome and Carthage;" "The Spartan and Theban Supremacy."

Passing to the history of the mother country, we can very cordially recommend *Freeman's Old English History* (Macmillan, $2); and the same author's *Brief History of the Norman Conquest* (Macmillan, 75 cents). *Green's Short History of the English People* (Harpers, $1.75) is, emphatically, the best compend of English history — admirable in its scope and in the spirit which animates it; but not quite so trustworthy as it should be in matters of detail. To supplement Green, we would decidedly recommend *Knight's Popular History of England*, of which the London Academy says: "It stands alone as the one general history of the country, for the sake of which all others will be surely and speedily set aside." This work is non-partisan in its character; it covers the entire period of British history and discusses every phase of English life and manners. An edition of it is published by T. W. Crowell of New York, in eight volumes, at the nominal price of twelve dollars. We have had it offered to us for five dollars; and the handsome English edition (8 volumes, 8vo., illustrated) can be had for eighteen dollars though nominally held at twenty-five dollars. Meanwhile, Messrs. Funk & Wagnall, of New York, offer the complete work (in somewhat unattractive form), for only two dollars and eighty cents. *Justin McCarthy's History of Our Own Times* (Harpers, 2 vols., $2.50) is a most interesting and valuable work; and information respecting our own times is more desirable and more difficult to obtain than information concerning any other period. It should, by all means, be purchased for the school library. Of "the great English historians," we would recommend *The Student's Hume* and *The Student's Hallam* (Harpers, $1.25 each). Of *Macaulay's Complete Works* — history, essays, speeches and poems — we recommend the edition published by Estes & Lauriat (6 vols., 12 mo.), at the nominal price of nine dollars. We have had it offered for six dollars.

The Student's France (Harpers, $1.25) is a very satisfactory history of that country; though some would prefer *Masson's Abridgment of Guizot* (Estes & L., $3). *Lacombe's Growth of a People* (Holt, $1) is brief, but very bright and suggestive. Of the school histories of Germany, the best is probably that of *Charlton Lewis* (Harpers, $2.50). Of Motley's works, our school libraries should certainly contain *The Rise of the Dutch Republic* (Harpers, 3 vols., $6); and might well contain the entire series. *Prescott's Ferdinand and Isabella* (Lippincott, 3 vols., $6.75), will afford the best

view of Spain while at the zenith of her power and greatness, and will be an adequate representation of Prescott, whose "Conquest of Mexico" and "Conquest of Peru" are not now regarded as altogether trustworthy.

Good books to fill gaps in a historical library are afforded by *The Epochs of History Series*, reprinted by the Scribners at one dollar a-piece. This series includes the following volumes, of which we *italicize* those which we can especially recommend:

The Era of the Protestant Revolution.
The Crusades.
The Thirty Years War, 1618–1648.
The Houses of Lancaster and York.
The French Revolution and First Empire.
The Age of Elizabeth.
The Fall of the Stuarts.
The Puritan Revolution.
The Early Plantagenets.
Age of Anne.
The Beginning of the Middle Ages.
The Normans in Europe.
Frederick the Great and Seven Years' War.
The Epoch of Reform, 1830–1850.

We would advise parents and teachers to keep Dickens' *Child's History of England* (which is wretchedly distorted) out of the hands of children, substituting for it *Miss Yonge's History of England* (Lothrop, $1.50).

Passing to our own country, *Higginson's Young Folks History of the United States* (Lee & Shepard, $1.50) should be in every school library, and much the same may be said of *Greene's Historic View of the American Revolution* (Hurd & Houghton, $1.50). Both of these books are admirable, which is more than can be said, without serious qualification, of any of the more extended histories of our country. From these more extended histories we should select that of *Hildreth* (Harper & Bros., 6 vols., $12), rather than that of Bancroft, for a school library. It is briefer, more comprehensive and, on the whole, more readable. *Doyle's English Colonies in North America* (Henry Holt) is exceptionally good on the subject of which it treats; and his brief *History of the United States* (Henry Holt, $1.25) is one of the best yet published. Meanwhile, the young people will be interested in J. Esten Cooke's *Stories of the Old Dominion* (Harpers, $1.50); Horace E. Scudder's *Men and Manners in America One Hundred Years Ago* (Scribner); and Rossiter Johnson's *Old French War* and *War of* 1812 (Dodd, Meade & Co., $1.25 each).

The best single volume for the study of the events which led to our great rebellion is probably *Greeley's American Conflict* (O. D. Case & Co.), and no better general survey has been published of the death-grapple in which that conflict culminated than *Draper's Civil War in America* (Harpers, 3 vols., $10.50). For a fair and dis-

passionate view of the war from a southern stand-point, we can recommend *Childe's Life of General Lee* (Routledge, $3). The series now in process of publication by the Scribners, under the title of *The Campaigns of the Civil War*, is also well fitted to illustrate our recent history. Twelve volumes are already issued (at one dollar a-piece); each prepared by some one who had special sources of information with reference to his assigned theme. It is too early to speak the final word with reference to the military or political movements of our late war, but a selection from these volumes should certainly be found in every school library; and the entire set is eminently desirable. The same may be said of *The Navy in the Civil War* (Scribners, 3 vols., $1 each). Even higher praise can be given to *The American Statesmen Series*, now in process of publication by Houghton, Mifflin & Co., at one dollar and twenty-five cents a volume. Four volumes of this series — devoted to John Quincy Adams, Alexander Hamilton, John C. Calhoun and Andrew Jackson — have already appeared, and they merit unqualified praise. Seven other volumes are in preparation by persons who are especially competent to handle the themes assigned them, and still others are to be announced. The same firm have, also, begun the publication of an "American Commonwealth Series," intended to include histories of such of the States as have exerted some positive influence in shaping the national government, or have illustrated, in a noteworthy degree, any peculiar political principles. Of the first volume of this series — *Virginia*, by J. Esten Cooke — we can speak in the highest terms.

Before dismissing this branch of our theme, we must mention in terms of the highest praise, the historical writings of Francis Parkman with reference to French and Indian themes. His *Pioneers of France in the New World*, and his *La Salle and the Discovery of the Great West*, ought to be in every school library; but since Messrs. Little & Brown have given us a new and cheap edition of Parkman's Complete Works (8 vols., at only $12), it is best not to make two bites at a cherry, but buy the whole set and educate our boys and girls up to reading them.

Charles T. Congdon's *Recollections of a Journalist* we would also recommend, as fitted to put the rising generation somewhat on a level with their fathers, so far as knowledge of the period immediately preceding our civil war is concerned. And a good word should be spoken for Charles Carleton Coffin's *Old Times in the Colonies* ($3); *Boys of Seventy-Six* ($3); *Building of the Nation* ($3); and *Boys of Sixty-One* — a series of juveniles which form a connected history of our republic, and which we happen to know to be immensely attractive to the class of readers for whom they are intended, and by no means repulsive to maturer minds. *Champlin's Young Folks' History of the War for the Union* (Henry Holt & Co., $2.75) will also prove attractive and valuable.

POLITICAL AND SOCIAL SCIENCE

is closely related to the department of history. Indeed, some of the volumes which we have already named might quite as appropriately fall under this head. A few more volumes, carefully selected, will perhaps be all that is needed, in this direction, by such a library as we have in view.

The student will gain an adequate comprehension of the political institutions of the mother-country from *P. V. Smith's History of English Institutions* (Lippincott, $1.50); *Ranne's English Constitution* (Scribners, $1); *Creasy's Rise and Progress of the English Constitution* (Appletons, $1.50); and *Fonblanque's How We are Governed* (F. Warne & Co.). On American institutions we would recommend *Pomeroy's Introduction to the Constitutional Law of the United States* (H. M. & Co., $5); *Johnston's American Politics*, which has recently been revised and enlarged (Henry Holt & Co., $1); *Nordhoff's Politics for Young Americans* (Harpers, 75 cents); *Andrews' Manual of the United States Constitution* (Wilson, Hinkle & Co., $1.50); *Towle's History and Analysis of the Constitution of the United States* (Little, Brown & Co., $1.75); and *The Federalist*, of which the Scribners publish the best edition (price, $2.50).

Perry's Introduction to Political Economy (Scribners, $1.50), will be an adequate representation for our library of the principles of Free Trade, while Protectionist views are ably set forth in *Dr. Wilson's Lectures on Political Economy* (D. Appleton & Co.). Our library should certainly contain *Bagehot's Lombard Street; a Description of the Money Market* (Scribners, $1.75). And we would also recommend two little monographs on *The Free Trade Movement in England* and *English Journalism*, published by Cassell, Petter & Galpin, at fifty cents each.

Under this head we should also include *Goodrich's Select British Eloquence* (Harpers, $4); *Webster's Great Speeches* (Little & Brown, $3); and *The Clarendon Press Burke* (2 vols., $3). These works will throw light on many vexed political questions, and render invaluable service in the department of Elocution. *Parker's Golden Age of American Oratory* will also be useful in the same direction.

ANTHROPOLOGY, ETHNOLOGY, ARCHÆOLOGY.

We find ourselves compelled to retrace our steps, for even the humblest school library should afford some information respecting recent investigations concerning the prehistoric condition of the human race. Under this head, however, we shall name but a few books, as subjects of this nature demand more maturity of thought than most students in our secondary institutions of learning possess. Perhaps it will be sufficient if our school library contains *Clodd's Childhood of the World* (Appletons, 50 cents); *Keary's Dawn of History* (Scribners, $1.25); *De Quatrefages' Natural History of*

Man (Appletons, $1); *Lubbock's Origin of Civilization* (Appletons, $2); *Peschel's Races of Men* (Appletons, $2.25.; *Dawson's Fossil Men and Their Modern Representatives; Berthet's Prehistoric World* (Porter & Coates, 75 cents); *S. Baring Gould's Curious Myths of the Middle Ages* (Lippincott, $2.50); and *Tyler's Anthropology* (Appletons, $2).

GENERAL LINGUISTIC SCIENCE

is closely related to the department just dismissed, and may be discussed with even greater brevity. The school library needs but few books here, but should take care that they are thoroughly good books, as there is more nonsense and twaddle written about Philology than almost any other subject.

We can heartily commend *Peile's Primer of Philology* (Appletons, 50 cents), and should certainly buy for our library *Max Muller's Science of Language* (Scribners, 2 vols., $4), and *Whitney's Life and Growth of Language* (Appletons, $1.50).

BIOGRAPHY.

We have already mentioned, under other departments, numerous biographical works, but deem it especially important for the class of students that we have in mind, that the department of biography be full and attractive. A good biographical dictionary is the first *desideratum*, and for ordinary use *Lippincott's Biographical Dictionary* (1 vol., sheep, $10), leaves little to be desired. *Routledge's Men of the Time* (price $5) is invaluable as a source of brief but trustworthy information respecting persons of note who are still living, but one should be sure to get a recent edition of this work, which is constantly undergoing revision. *Parton's People's Book of Biography* (Virtue, $3.50), would be very useful in a school library; and hardly less useful would be the series issued by the Putnams (at $1.50 each), which includes *English Statesmen, English Radical Leaders, French Leaders, German Political Leaders. Justin McCarthy's Modern Leaders* (Sheldon, $1.75) falls within the same category, and is perhaps worthy of equal consideration. *Smiles' Brief Biographies* (Osgood, $1.50) should by no means be overlooked, and the Appletons' "New Handy Volume Series" contains (at thirty cents in paper and sixty cents in cloth) admirable sketches of *The Great German Composers, The Great Italian and French Composers, The Great Singers* (two volumes) and *The Great Violinists and Pianists.* To students of music these little volumes should be of surpassing interest. *Mrs. Oliphant's Makers of Florence* (Macmillan, $3), which introduces us to Dante, Savanarola and Michael Angelo, is also an interesting and instructive book.

We pass to the enumeration of individual biographies, contenting ourselves in nearly every case with the briefest possible mention of the works that we recommend. And, first, a group of books which may serve — in one direction or another — as an inspiration to our

students. Under this head we include *Smiles' Life of Stephenson* (Osgood, $1.50); *Hugh Miller's My Schools and Schoolmasters* (Carter, $1.50); *Parton's Life of Greeley* (Houghton, Mifflin & Co., $2.50); *Gibbon's Memoir of My Life and Writings.* In addition, *Gladstone's Life of Faraday* (Harpers, $1.50); *Brock's Life of Havelock* (Am. Tr. Soc., 40 cents); *Life of Admiral Coligni* (Putnams, $1); *Brewster's Martyrs of Science* (Harpers, 75 cents); and *Brown's Life of Choate* (Little, Brown & Co., $2) may safely be mentioned among the inspirational books.

Next, a group of the old favorites; though most of the biographies of thirty years ago are — both in literary style and in mechanical execution — terribly unattractive to the rising generation. Irving's works, however, are never out of date, and we confidently recommend:

Irving's Goldsmith (Putnams, $1.25).
Irving's Columbus (Putnams, 3 vols., $3.75).
Irving's Mahomet (Putnams, 2 vols., $2.50).
Irving's Washington (Putnams, 1 vol., $1.25).

We venture, also, to add:

Southey's Life of Nelson (Harpers, 75 cents).
Wirt's Life of Patrick Henry (Claxton, $1.50).
Franklin's Autobiography (Mason, $1.50).
Sargent' Life of Clay (Porter & Coates, $1.25).

Of recent biographies which should be in every school library, we may mention:

Hughes' Life of Alfred the Great (Osgood, $1.25).
William the Silent (Lothrop, $1.50).
Sister and Saint, or Jacqueline Pascal.

We would also recommend — as throwing light on recent American history — *Oliver Johnson's Life of Garrison* (Houghton, Mifflin & Co., $2); *Thaddeus Stevens, Commoner;* and (if it can be obtained) *Holland's Life of Lincoln* (C. A. Nichols, $3.00). A similar service will be rendered with reference to English history by *Trevelyan's Life of Fox* (Harpers, $2.50); *Trevelyan's Life of Macaulay* (Harpers, $1.75); and *Jones' Life of Gladstone* (Appletons, 60 cents).

Before dismissing this branch of our subject, we must say a good word for *Abbott's Biographical Histories* (Harpers, 32 vols., $1 each). J. S. C. Abbott's "Life of Napoleon" is, however, expensive and altogether too eulogistic. We should recommend, in preference, *Hazlitt's Life of Napoleon* (Lippincott, 3 vols., $4.50).

FICTION.

Passing from real to fictitious life we shall be somewhat liberal in our recommendations; for there are a host of thoroughly good novels which clamor to be read, and a host of thoroughly bad ones which need to be crowded out, and *will* be crowded out if healthful stories which possess some human interest are freely furnished to our

pupils and our children. Of the old stand-bys, we mention in satisfactory but cheap editions:

Robinson Crusoe (Porter & Coates, 75 cents).
The Arabian Nights (Porter & Coates, 75 cents).
Gulliver's Travels (Porter & Coates, 75 cents).
The Vicar of Wakefield (Porter & Coates, 75 cents).
Don Quixote (J. W. Lovell, 75 cents).
Æsop's Fables (Porter & Coates, 75 cents).

We quote the list price of these books, though they are often retailed as low as forty cents a volume, and one-third off wouldn't be much of a discount on them. To the books above mentioned we should add *Bunyan's Pilgrim's Progress*, of which Houghton, Mifflin & Co. publish a very fair edition at seventy-five cents, and *Victor Hugo's Les Miserables* (Routledge, $1.25). Of complete sets of novels we recommend very few, but a complete set of *The Waverly Novels* is desirable, and Routledge publishes a very neat thirteen-volume edition which is freely sold at ten dollars. A complete set of *Dickens* will also be desired in most libraries, and for this also, we shall do well to turn to the Messrs. Routledge, whose attractive fifteen-volume edition (listed at $22.50) we shall have little difficulty in buying for ten dollars. It should by all means be supplemented by *The Dickens Dictionary*, published by Houghton, Mifflin & Co., for two dollars. If one wants a complete set of *Thackeray*, the best cheap edition is that of Estes & Lauriat, which we bought recently for ten dollars. For the same price one can obtain from Houghton, Mifflin & Co. *The Globe Hawthorne;* and we would by all means recommend the purchase of that or some better edition. Of Cooper's works, we should content ourselves with *The Sea Tales* and *The Leather-Stocking Tales*, which the Appletons will furnish us in two octavo volumes for two dollars each, or Routledge & Co., in more compact form, for $1.50 each. Of Bulwer we would recommend:

The Last Days of Pompeii (Porter & Coates, 75 cents).
Harold, Last of the Saxon Kings (Lippincott, $1.50).
The Last of the Barons (Lippincott, $1.50).
The Caxtons (Lippincott, $1.50).

Still, if a demand should be developed for Bulwer's later novels, we should certainly gratify it. Of George Eliot's novels, we would recommend *Adam Bede*, *Felix Holt*, *Romola* (Harpers, $1.50 each), and *Middlemarch* (Harpers, $1.25). It should be understood, however, that any volume included in the "Harpers' Library of Select Novels" (as most good English novels are, or used to be) can be obtained, "in half binding — leather back and paper sides," for twenty-five cents in addition to the list price. Thus one can effect a considerable saving in the price of the books recommended (*Felix Holt*, for instance, would cost but seventy-five cents); but the books thus furnished are not lettered on the back and in no respect attractive. It is well, also, to keep the run of *Lovell's Library*, in which, for fifty cents each, one can obtain — well printed and neatly

bound in cloth — several of the novels that are included in our list. The "pocket edition" of *The Seaside Library* also contains neatly printed copies of many of the best standard and recent novels; but, as yet, only in paper bindings.

Of Charles Kingsley's novels, we should hope to create a demand for *Alton Locke*, *Hypatia* and *Westward Ho!* (Macmillan, $1 each); and we should be sure of a demand for as many of Marryatt's novels as we cared to give our pupils, though we should probably try to content them with *Midshipman Easy*, *Peter Simple* and *Japhet in Search of a Father* (Routledge, $1 each).

We pass to the recommendation of the best single novels (with few exceptions) of various authors, both English and American, regarding it as vastly better to include in our library the representative works of many authors, rather than complete sets of only a few. We shall simply indicate our preferences without vindicating our choice by argument, and we shall exclude from our list all namby-pamby stories, and all novels of the wildly sensational school. There are too many good stories in existence to waste one's time in reading poor ones.

Charlotte Bronte's Jane Eyre (Harpers, $1).
Charles Reade's Put Yourself in His Place (Harpers, $1.25.)
Mrs. Muloch Craik's John Halifax (Harpers, $1 50).
William Black's Princess of Thule (Harpers, $1.25).
R. D. Blackmore's Lorna Doone (Harpers, $1).
W. Clarke Russell's Wreck of the Grosvenor (Harpers, 30 cts.).
Anthony Trollope's Framley Parsonage (Harpers, $1.75).
Geo. MacDonald's Sir Gibbie (Lippincott, $1.25).
Grace Aguilar's Home Influence (Appletons, $1).
Grace Aguilar's Mother's Recompense (Appletons, $1).
Maiden and Married Life of Mary Powell (Appletons, 50 cts.).
The Household of Sir Thomas More (Dodd, Mead & Co., $1).
The Schönberg-Cotta Family (Dodd, Mead & Co., $1).
Molly Bawn (Lippincott, $1.25).
Walford's Mr. Smith (Henry Holt & Co., $1).
The Wooing O' T, (Henry Holt & Co., $1).
Miss Yonge's Heir of Redclyffe (Macmillan $1.50).
Mrs. Stowe's Uncle Tom's Cabin (Houghton, Mifflin & Co., $2).
The Wide, Wide World (Lippincott, $1.75).
The Lamp-Lighter (Houghton, Mifflin & Co., $1.50).
Two Lives, or To Seem and To Be (Appletons, $1.25).
Trowbridge's Neighbor Jackwood (Tilton, $2).
Theodore Winthrop's John Brent (Henry Holt & Co., $1).
Edward Everett Hale's If, Yes and Perhaps (J. R. Osgood & Co., $1.50).
Edw. Eggleston's Hoosier Schoolmaster (Judd, $1.25).
W. M. Baker's New Timothy (Harpers, $1.50).
Miss Phelps' Dr. Zay (H. M. & Co., $1.25).
Mrs. Burnett's Lass O' Lowrie's (Scribners, $1.50).
Miss Woolson's Anne (Harpers, $1.25).

T. B. Aldrich's Marjorie Daw, etc. (Houghton, $1.50).
Saxe Holm's Stories — 1 Series (Scribners, $1.50).
F. R. Stockton's Rudder Grange (Scribners, $1.25).
Henry James' American (Houghton, $2).
W. D. Howells' Wedding Journey (Houghton, $1.50).
W. D. Howells' Lady of the Aroostook (Houghton, $1.50).
W. D. Howells' Undiscovered Country (Houghton, $1.50).
Miss Howard's One Summer (Houghton, $1.25).
Miss Jewett's Deephaven (Houghton, $1.25).
Bret Harte's Luck of Roaring Camp, etc. (Houghton, $1.50).
Bret Harte's Twins of Table Mountains, etc. (Houghton, $1.50).
Warner's My Summer in a Garden (Houghton, $1).
Mrs. Whitney's Faith Gartney's Girlhood (Houghton, $1.50).
Mrs. Whitney's The Gayworthys (Houghton, $1.50).
Mrs. Whitney's Leslie Goldthwaite (Houghton, $1.50).
John Habberton's Helen's Babies (Loring, $1)
Joel C. Harris' Uncle Remus (Appletons, $1.50).
Wallace's Ben Hur (Harpers, $1.50).
E. P. Roe's Face Illumined (Dodd, Mead & Co., $1.50).

JUVENILES.

Most of the novels which have been mentioned will, we trust, prove attractive to the young reader; but we must furnish a list of stories which may be regarded as peculiarly his own; though as we have in mind a library for an academy or high school, we shall not attempt to cater for the very youngest readers.

In the purchase of juveniles (which are very numerous, and in many cases very poor), we would not advise one to buy a complete set of any author, so much as a judicious selection from the writings of the best authors. And *a judicious selection will generally cover the earlier books of a writer of juveniles*, since most writers in this department become more sensational the longer they write. The wildly sensational we have endeavored to exclude from our lists; as also every book which is of immoral tendency, and every book which presents an unreal view of life. Here, as elsewhere, we have endeavored to name books which were positively inspiriting and ennobling. But whatever else may be thought of the books recommended, we trust none of them will be pronounced dull; for that is, in a juvenile, a defect which no amount of excellence in other directions can extenuate.

Our list includes:
The Swiss Family Robinson (Porter & Coates, 75 cents)
Tom Brown at Rugby (Porter & Coates, 75 cents).
Marryatt's *Settlers in Canada* (Appletons, $1).
Marryatt's *Masterman Ready* (Appletons, $1).
Marryatt's *Scenes in Africa* (Appletons, $1).
Andersen's *Fairy Tales* (Scribners, $1).
Grimm's *Fairy Tales* (Scribners, $1).

Chas. Kingsley's *Water Babies* (Macmillan).
Alice in Wonderland (McMillan, $1.50).
Leland's *Johnnykin and The Goblins* (Macmillan, $1.50).
Kingston's *Roger Willoughby.*
Kingston's *Peter Trawl* (Armstrong, $2).
Kingston's *Dick Chevely* (Lippincott, $2).
Kingston's *Hurricane Hurry* (E. P. Dutton, $2).
Du Chaillu's *Lost in the Jungle* (Harpers, $1.50).
Du Chaillu's *Stories of the Gorilla Country* (Harpers, $1.50).
Du Chaillu's *Wild Life under the Equator* (Harpers, $1.50).
Jules Verne's *Round the World in Eighty Days* (Porter, $1.25).
Jules Verne's *From the Earth to the Moon* (Scribners, $1.50).
Jules Verne's *Great Fur Country* (Osgood, $3.50).
Mayne Reid's *Tales of American Adventure* (Miller, 6 vols., $9).
Mayne Reid's *Tales of Foreign Adventure* (Miller, 6 vols., $9).
Aldrich's *Story of a Bad Boy* (H. M. & Co., $1.50).
Warner's *Being a Boy* (H. M. & Co., 75 cents).
W. O. Stoddard's *Dab Kinzer* (Scribners, $1).
Noah Brooks' *Boy Emigrants* (Scribners, $1.50).
Noah Brooks' *Fairport Nine* (Scribners, $1.25).
Everett's *Changing Base* (Lee & Shepard, $1.25).
Everett's *Double Play* (Lee & Shepard, $1.25).
Trowbridge's *Jack Hazard Series* (Porter & Coates, 6 vols., $7.50).
Hans Brinker (Scribners, $1.50).
Miss Alcott's *Little Women* (Roberts Bros., $1.50).
Miss Alcott's *Little Men* (Roberts Bros., $1.50).
Miss Alcott's *Rose in Bloom* (Roberts Bros., $1.50).
Jan of the Windmill.
Vice Versa (Appletons, $1).
Gladys the Reaper.
Alger's *Ragged Dick Series* (Porter & C., 6 vols., $7.50).
C. A. Stephens' *Camping Out Series* (Porter & C., 6 vols., $7.50).
An Involuntary Voyage (Harpers, $1.25).
Nordhoff's *Man of War Life* ($1.50).
Keary's *Heroes of Asgard* (Macmillan, $1).
Bulfinch's *Age of Chivalry.*
Church's *Stories from Homer* (Macmillan).
Miss Yonge's *Book of Golden Deeds* (Macmillan, $1.25).
A Dream of Rubens.
Lynde Palmer's *Drifting and Steering.*
E. E. Hale's *In his Name.*
W. O. Stoddard's *Talking Leaves.*
St. Winifred, or the World of School.
American Boys' Handy Book (Scribners, $3).

MINOR MORALS.

It is to be desired that the children in our schools read something more and better than mere stories, and under the heads of history,

biography and the natural sciences, we have tried to suggest books that will prove attractive, yet useful to them. Before dismissing the department of "Juveniles," we would name a few books written expressly for the young, which may be less interesting than the average "juvenile," but will be quite as beneficial:

E. E. Hale's *How to Do It* (Roberts Bros., $1), which abounds in useful information.

E. E. Hale's *What Career* (Roberts Bros., $1.25), which will afford at once inspiration and guidance.

The Bazar Book of Decorum (Harpers, $1).

Matthew's *Getting On in the World* (Griggs, $1.50).

Munger's *On the Threshold* (H. M. & Co., $1).

Hughes' *Manliness of Christ* (H. M. & Co., $1).

Sarah Tytler's *Papers for Thoughtful Girls* (Estes & Lauriat, $1.50).

In the same line as the books just named, but adapted to persons of a little more maturity are:

Dr. Holland's *Timothy Titcomb's Letters.*

Dr. Holland's *Gold Foil.*

Dr. Holland's *Jones Family* (Scribners, $1.25 each).

Hamerton's *Intellectual Life* (Roberts, $2).

Smiles' *Self-Help* (Harpers, $1.25).

Smiles' *Character* (Harpers, $1.25).

Smiles' *Duty* (Harpers, $1.25).

Smiles' *Thrift* (Harpers, $1.25).

We pass to the department of

TRAVEL AND ADVENTURE

which ought to be an especially attractive and especially valuable department to teachers and pupils alike. And first, we mention some *books of residence*, which are, to our mind, more significant, as a rule, than *books of travel:*

Hamerton's *Around My House* (Roberts, $2).

Howells' *Venetian Life* (H. M. & Co., $1.50).

John Hay's *Castilian Days* (H. M. & Co., $2).

Brace's *Home Life in Germany* (Scribners, $1.75).

Klunzinger's *Upper Egypt* (Scribners, $3).

McCoan's *Egypt as It Is* (Dodd, Mead & Co., $2).

Thompson's *Land and the Book* (Harpers, 2 vols., $5).

Griffis' *Mikado's Empire* (Harpers, $4).

Wallace's *Russia* (Henry Holt & Co., $2).

Escott's *England.*

Hare's *Walks in Rome* (Routledge, $3.50).

Goodell's *Forty Years in the Turkish Empire* (Carters, $2.50).

Passing to books that are more legitimately books of travel, and premising that really good books of travel are the rarest of all good books, we venture to recommend:

Kinglake's *Eothen* (Mason, $1.50).

Stanley's *Sinai and Palestine* (Scribners, $2.50).

Curtis' *Nile Notes of a Howadji* (Harpers, $1.50).
Curtis' *Howadji in Syria* (Harpers, $1.50).
Palgrave's *Central and Eastern Arabia* (Mac., $2.50).
Bayard Taylor's *Views Afoot* (Putnams, $1.50).
Tyndall's *Hours of Exercise in the Alps* (Appletons, $2).
Kennan's *Tent Life in Siberia* (Putnams, $2).
Howells' *Italian Journeys* (H. M. & Co., $1.50).
Warner's *Saunterings* (H. M. & Co., $1.25).
Warner's *In the Wilderness* (H. M. & Co., 75 cents).
Sargent's *Arctic Adventures by Sea and Land* (Thompson, $2).
Kingston's *Great African Travelers* (Routledge, $2).
Dana's *Two Years Before the Mast* (H. M. & Co., $1.50).
Round the World in the Sunbeam.
E. E. Hale's *Family Flight over Egypt and Syria* (Lothrop, $2.50).
E. E. Hale's *Family Flight over France, Germany, Norway and Sweden* (Lothrop, $2.50).
Thousand Miles in the Rob Roy (Roberts, $1.25).
The Rob Roy in the Baltic (Roberts, $1.25).
Gaddings with a Primitive People (Holt, $1).
Kendall's *Santa Fe Expedition.*
Nordhoff's *California* (Harpers, $2).
Codman's *Round-Trip* (Putnams, $1.50).
Burnaby's *Ride to Khiva* (Harpers, $1.75).
Wallace's *Malay Archipelago* (Harpers, $2.50).
Charles Kingsley's *At Last* (Macmillan, $1.75).
Miss Bird's *Unbeaten Tracks in Japan* (Putnams, $3).
The French at Home (Dodd, Mead & Co.).
Rollo in Europe (Sheldon, 10 vols., $9).
Grant White's *England Without and Within* (H. M. & Co., $2).
Snider's *Walks in Hellas* (J. R. Osgood & Co., $25.50).

Under this head, as well as anywhere, we may mention a series of very valuable little books (which will be of use in several departments) entitled *Foreign Countries and British Colonies* (Sampson, Low & Co., 18 vols., $1.25 each).

THE NATURAL SCIENCES.

Especial care is necessary with reference to the purchase of books that fall within this department. The books that we want for our library must be recent, since progress in the natural sciences is so rapid, so vast and so incessant. Most of the volumes in "Scribner's Illustrated Library of Wonders," for instance, were, when that attractive series was published, very good, though some were rather sensational; but the progress of the sciences makes that series already a little *passé*. But the books that we place in the hands of our students must not only be fresh; they must be comprehensive and exact, in which particular a good many attractive volumes are conspicuously defective. We would advise the buyer of books for an academy library to purchase no books in this department until he

has examined it thoroughly, or had it passed upon by competent authority. He will be safe, however, in purchasing the following works:

Huxley's Physiography (Appletons, $2.50).
Guyot's Physical Geography (Scribners, $2.25).
Guyot's Earth and Man (Scribners, $1.75).
Le Conte's Geology (Appletons, $4).
Agassiz's Geological Sketches (H. M. & Co., 2 vols., $3).
Atkinson's Ganot's Physics (W. Wood, $5).
Deschanel's Natural Philosophy (Appletons, $6).
Cooke's New Chemistry (Appletons, $2).
Faraday's Chemical Forces ($1).
Tyndall on Heat (Appletons, $1.50).
Tyndall on Sound (Appletons, $2).
Tyndall's Lectures in America (on Light, Appletons, $1.50).
Guthrie's Magnetism and Electricity (Putnams, $1.50).
Newcomb's Astronomy (Harpers, $2.50).
Gray's Manual of Botany (Ivison, $3).
Agassiz's Methods of Study in Natural History (H. M. & Co., $1.50).
Huxley's Crayfish (Appletons, $1.75).
Huxley's and Youman's Elements of Physiology and Hygiene (Appletons, $1.50).
Darwin's Voyage of a Naturalist (Appletons, $2).
Routledge's History of Science ($3).
Helmholtz's Scientific Lectures (Appletons, $2).
Herschell's Scientific Lectures (Strahan, $2).

These are all standard works, and perhaps the best of their kind. But they are pretty substantial; and our school library must embrace something lighter and more attractive to the juvenile minds. It is in the purchase of books of this class, however (whose name is legion), that especial caution should be observed, as mere dabblers in science are constantly flooding the market with volumes which, upon a casual inspection, are more attractive than some which we recommend. The following books we know to be both interesting and reasonably trustworthy:

Johnston's *Chemistry of Common Life* (new, one vol. edition).
Faraday's *Chemistry of a Candle* (Harpers, 85 cents).
Macé's *Mouthful of Bread* (Harpers, $1.75).
Gray's *How Plants Grow* (Ivison & Co., $1.12).
Kingsley's *Town Geology* (Macmillan, $1.75).
Kingsley's *Madam How and Lady Why* (Macmillan, $1.75).
Kingsley's *Tommy Try and What He Did in Science* (Appletons, $1.50).
White's *Natural History of Selborne* (Macmillan, $2).
Miss Buckley's *Progress of Science* (Appletons, $2).
Miss Buckley's *Fairy Land of Science* (Appletons, $1.50).
Science for All (Cassell, Petter & Galpin, 5 vols.).
Buckland's *Log Book of a Fisherman* (Lippincott, $3).

Buckland's *Curiosities of Natural History* (Scribners, 4 vols., $7)
Dawson's *Story of the Earth and Man* (Harpers, $1.50).
Biart's *Adventures of a Young Naturalist* (Harpers, $1.75).

In this connection we can heartily recommend the Appletons' Series of "Science Primers" (45 cents each), covering — with an introductory volume by Huxley — brief treatises, by acknowledged masters of the themes which they discuss, on Chemistry, Physics, Geology, Physiology, Astronomy and Botany. The similar series issued by the English "Society for the Promotion of Christian Knowledge," is also worth looking at. Of the Appleton's "International Scientific Series," we have recommended here and there, single volumes; but a teacher who is competent to make use of the volumes of this series will, as a rule, be adequate to the task of making an intelligent selection from them. Many of them are rather above the range of academic students.

Since many of our academies are located in farming communities, which it is desirable to interest in their work, and as those academies number among their pupils farmers' sons who may ultimately till the paternal acres, we reproduce under this head, from the New York *Examiner*, a few hints with reference to an agricultural library, premising that those hints are from a thoroughly competent agriculturist:

"Among standard books on general farming, gardening and fruit-culture are the following:

American Farm Book. (New.) R. L. and L. F. Allen. $2.50.
The Fruit Garden. P. Barry. $2.50.
Gardening for Profit. Peter Henderson. $1.50.
Gardening for Pleasure. Peter Henderson. $1.50.
How Crops Grow. Prof. Samuel W. Johnson. $2.
How Crops Feed. Prof. Samuel W. Johnson. $2.
Fruits and Fruit Trees of America. A. J. and C. Downing. $5.
Grape Culturist. A. S. Fuller. $1.50.
Small Fruit Culturist. A. S. Fuller. $1.50.
Pear Culture for Profit. P. T. Quin. $1.
American Fruit Culturist. J. J. Thomas. $3.
Success with Small Fruits. E. P. Roe. $5.
Book of the Farm. George E. Waring, Jr. $2.
Artificial Manures. George Ville. Translated by Wm. Cookes, F. R. S. $6.
School of Chemical manures. From the French of George Ville. By A. A. Fresquet, Chemist and Engineer. $1.25.
Peach Culture. J. Alexander Fulton. $1.50.
Cranberry-Culture. Joseph J. White. $1.25.
Insects Injurious to Vegetation. Thaddeus William Harris, M. D. *Plain.* $4.
Insects Injurious to Vegetation. Thaddeus William Harris, M. D. *Colored Plates.* $6.50.
Injurious Insects of the Farm and Garden. Mary Treat. $2.
The Rose. H. B. Ellwanger. $1.25.

Hedges and Evergreens. J. A. Warder. $1.50.
Gardening for Young and Old. Joseph Harris. $1.25.

From the long list of works on horses, cattle, sheep, swine and poultry, the following are selected as among the best:

American Reformed Horse Book. Prof. Geo. H. Dadd. $2.50.
Coleman on Pathological Horse Shoeing. $2.
Modern Horse Doctor. Prof. George H. Dadd. $1.50.
American Cattle Dealer. Prof. George H. Dadd. $1.50.
Farmer's Veterinary Adviser. Prof. James Law. $3.
American Cattle. Lewis F. Allen. $2.50.
Swine Husbandry. F. D. Coburn. $1.75.
Harris on the Pig. Joseph Harris. $1.50.
Practical Shepherd. Henry S. Randall, LL. D. $2.
Shepherd's Manual. Henry Stewart. $1.50.
Lewis' Practical Poultry Book. $1.50.
Poultry Book. W. B. Tegetmeier. $9.
Practical Poultry Keeper. L. Wright. $2.
Practical Dairy Husbandry. X. A. Willard. $3.
Quinby's New Bee-Keeping. L. C. Root. $1.50.

To this list might very properly be added a number of the standard cookery books such as *The Easiest Way in Housekeeping and Cooking*, by Helen Campbell; Miss Parloa's *New Cook Book; Common Sense in the Household*, by Marion Harland, etc. Nor should one or two good works on rural architecture, landscape-gardening, floriculture, etc., be omitted from the collection."

Following out the hint at the close of the article which we have so liberally quoted, we may recommend:

Downing's *Hints to Persons About Building in the Country* (Wiley, $2).

Downing's *Cottage Residences* (Wiley, $6).

Downing's *Theory and Practice of Landscape Gardening* (Wiley, $6.50).

MENTAL AND MORAL SCIENCE.

Under this head — considering the nature of the library that we have in mind — our recommendations will be comparatively few. Every academy library should, however, contain some well selected volumes which discuss the vexed questions of man's intellectual and moral being; and we can confidenty recommend, as affording a general survey of the entire subject, *Hopkins' Outline Study of Man* (Scribners, $1.50). Krauth's edition of *Fleming's Vocabulary of Philosophy* will afford invaluable assistance where the ordinary dictionaries break down. *Havens' History of Ancient and Modern Philosophy* (Sheldon, $2), is, perhaps, the best history for our present purpose; but it should be supplemented by *Masson's Recent British Philosophy* (Appletons, $1.25). If we were to name but one book in the department of Metaphysics, it should be *Porter's Elements of Intellectual Science* (Scribners, $3). *Alexander's Outlines of Moral Science* (Scribners, $1.50) is very clear, sensible and

practical; *Calderwood's Moral Philosophy* (Macmillan, $2) is more scholarly and scientific. *Jevons' Elementary Logic* (Macmillan, $1.25) is the first book to buy in that department; but our library should certainly contain, in addition, *Jevons' Principles of Science.* Other interesting and valuable books for such a library as we now contemplate are:

Argyll's Reign of Law (Routledge, $2).
Elam's Physician's Problems (Osgood, $1.75).

EDUCATION.

Closely connected with the department just dismissed is the department of education. We recommend, as of general significance under this head,

Herbert Spencer on Education (Appletons, $1.25).
Calderwood's Teaching: Its End and Means (Macmillan, 75 cts.).
Quain's Defects in General Education (Macmillan, $1.25).
Farrar's Essays on a Liberal Education (Macmillan).
Page's Theory and Practice of Teaching (Barnes, $1.25).
Fitch's Lectures on Teaching (Macmillan, $1.75).
Payne's Lectures on Education (Macmillan).
Quick's Educational Reformers (Bardeen, $2).
Laurie's Life of Comenius (Macmillan).
Krüsi's Life of Pestalozzi (Wilson, Hinkle & Co., $2.25).
Browning's Educational Theories (Harper, 75 cents).
Calkins' Manual of Object Teaching (Harpers, $1.25).
Stanley's Life of Arnold (Scribners, $2.50).

ART.

Under this head we would recommend as, upon the whole, the most satisfactory works for our present purpose, and as quite sufficient for an ordinary school library:

D'Anvers' Elementary History of Art. $4.50.
Hamerton's Thoughts on Art (Roberts, $2).
Hamerton's Graphic Arts (Roberts, $2).
Mrs. Clement's Hand-Book of Legendary and Mythologic Art (H. M. & Co., $2.50).
Benjamin's Contemporary Art in Europe (Harpers, $3.50).
Benjamin's Art in America (Harpers, $4).
Miss Young's Ceramic Art (Harpers, $5).
Jarves' Art Ideal (H. M. & Co., $1.75).
Violet Le Duc's Learning to Draw (Putnams, $2).

POETRY AND THE DRAMA.

The best cheap edition of Shakspere — with whose works we naturally begin — is *The Arundel Shakspere* ($2) which reproduces the text of the famous *Globe* edition in type of twice the size. This should be supplemented by Rolfe's edition of the most significant of Shakspere's plays, which edition is decidedly the most attractive

and the best for school and home use. It is published by the Harpers for only fifty-six cents per volume, at which price our library can perhaps afford the entire set. It should certainly contain Rolfe's *Merchant of Venice*, *As You Like it*, *Lear*, *Othello*, *Macbeth*, *Hamlet* and *The Tempest*. As a help to the study of Shakspere, Dowden's *Shakspere Primer* (Appletons, 50 cents) will be invaluable. Our other older dramatists will, for our present purpose, be adequately represented by Swayne's *British Dramatists* (W. P. Nimmo, $2).

Ward's English Poets (Macmillan, 4 vols. $3) and Hale's *Longer English Poems* (Macmillan, $1.75) will save us the purchase of a good many single volumes, as they sufficiently illustrate a great many minor poets and furnish us with suggestive introductions and notes. We shall need however:

The Clarendon Press Milton (2 vols. $2.50).
The Clarendon Press Chaucer (3 vols. $2.50).
The Clarendon Press Faery Queene (2 vols. $1.50).
The Clarendon Press Dryden (1 vol. 90 cents).

The Chandos Scott ($1) is decidedly the best cheap edition of that author, and *The Chandos Byron* is complete, which few of the cheap editions of that author are. *The Chandos Book of Ballads* too ($1) is worthy of decided commendation, and is all that most schools will want in this direction. Of *Tennyson* and *Browning*, T. Y. Crowell publishes a very satisfactory edition at only fifty cents. Of *Wordsworth*, we would recommend, as more complete than most of the other cheap editions, that published by Routledge ($1.75).

The other British poets are, perhaps, sufficiently represented in the various anthologies which we have recommended; but the complete works of *Spenser*, *Pope*, *Cowper*, *Burns* and *Shelley* can be obtained in the Appleton's Globe Edition for "one dollar a volume, less the discount," or at an even cheaper rate from the press of T. Y. Crowell, New York.

Of our American poets, the Academy library should certainly contain:

The Household Bryant (Appletons, $2).
The Household Longfellow (H. M. & Co., $2)
The Household Lowell (H. M. & Co., $2).
The Household Whittier (H. M. & Co., $2).
The Household Holmes (H. M. & Co., $2).

We would also recommend the annotated *American Poems*, edited by Horace E. Scudder and published by Houghton, Mifflin & Co. (price $1.25), and the *Longfellow* (price 60 cents), included in the same firm's *American Classics for Schools*.

GENERAL LITERATURE.

Under the head of *Belles Lettres*, or general literature, we have several books to suggest which we deem indispensable to any well-selected library. And first, *Bacon's Essays*, which may be purchased,

with Whately's valuable annotations, in the Student's edition (Lee & Shepard, $2.50); or, with less extended, but still valuable, notes, in the Golden Treasury edition (Macmillan, $1.25). Of Milton's prose, a fair representation will be found in *The Milton Anthology* (Henry Holt, $2); though an academy library should also contain *The Clarendon Press Areopagitica* (Macmillan, 75 cents). The type of Morley's edition of *The Spectator* (Routledge, $1.75) is somewhat fine; but in other respects it is one of the best editions. *The Tatler and The Guardian* can be had complete — if one desires more of this sort of literature — in Nimmo's edition, price two dollars. Coleridge's *Table Talk* (Routledge, 50 cents), and Lamb's *Essays of Elia* (Appletons, 60 cents), are, perhaps, all that we really need of these authors. De Quincey is useful in so many different directions that we are inclined to recall the opinion that our academy library does not need a full set of his works, and recommend *The Globe De Quincey* (H. M. & Co., 6 vols., $10). The same firm will furnish us with *The Fireside Emerson* (5 vols., $10); and we should by all means buy of them Rossiter Johnson's *Little Classics* (9 vols., $13). Holmes' *Autocrat of the Breakfast Table* (H. M. & Co., $1.25) must also be added to our list. Of Carlyle we can, perhaps, be content with *Sartor Resartus* and *Heroes and Hero-Worship*, which we can obtain of the Scribners for ninety cents each. Of Irving's works, we must certainly have — in addition to those already mentioned — *The Sketch Book*, *Bracebridge Hall* and *Knickerbocker's History of New York*, which we can obtain of the Putnams for one dollar and twenty-five cents each.

We are inclined, also, to suggest, as of especial value to the class of students that we have in mind, Matthew Arnold's *Essays in Criticism* (Henry Holt, $2), and Hare's *Guesses at Truth* (Macmillan, $1.25).

BOOKS OF REFERENCE.

We have already named, under specific heads, various books of this class, but there are still others of a general nature which require mention.

By common consent, the best encyclopædia is the *Encyclopædia Britannica*, now in process of republication. But that work is very expensive ($5 a volume for twenty-one or more volumes), and the articles which it contains are so long that one requires ample time to consult it, and so elaborate that a junior student can hardly consult it with profit. *Appleton's American Cyclopædia* (16 vols., $80, or *Johnson's New Universal Cyclopædia* (4 vols., $54) are superior, in both these respects, and much fuller on American topics. Of the two, we prefer Johnson's; but, in purchasing either for a school library, we should scan the lists of the second-hand dealers. A still more convenient encyclopædia, for hurried consultation on all sorts of topics, is *Chambers' Cyclopædia*, of which we should, on the whole, recommend Messrs. J. B. Lippincott & Co.'s reprint, which is offered in cloth (10 volumes, "household ed.") for $15, and in

sheep (10 volumes, "popular ed.") for $30. At these prices, no school that can afford to buy books at all need be without an encyclopædia (though either of the editions that we name can be bought for much less than the list price), and any school that buys *Chambers' Cyclopædia* will never regret the purchase.

In this connection we may also speak a good word for *The Young Folk's Cyclopædia* and *The Young Folks' Cyclopædia of Persons and Places* (Henry Holt & Co., $3 and $3.50), which will prove attractive and valuable to the younger class of pupils who would be repelled by a large encyclopædia.

Of atlases we will name three, in choosing from among which we should ourselves hesitate:

The International Atlas (Putnams, $5) which embodies all the maps, ancient and modern, that the ordinary student will need, and excels in giving comparative maps of the same country at different periods in its history. *The Library Atlas of Modern Historical and Classical Geography* (Putnams, $10), which is more comprehensive than the one just named and in very convenient form. *Zell's Descriptive Hand-Atlas of the World* (price $11), which some competent judges prefer to any other atlas that can be bought for any thing like the same money. It would be extremely useful to reinforce either of these atlases by *Sonnenschein & Allen's Royal Relief Atlas* (price $10), which shows one at a glance the physical features of the country he is studying.

MISCELLANEOUS.

Notwithstanding the number of topics under which we have given classified lists, there are still books — and those, too, very useful and attractive — which clamor for admission to our library; and we sweep them all into this *omnium gatherum:*

Chambers' Miscellany of Useful and Entertaining Tracts (Lippincott, 10 vols., $7.50). As interesting as it is instructive.

Chambers' Book of Days (Lippincott, 2 vols., $8). Full of out-of-the-way facts.

Brewer's Reader's Hand-Book (Lippincott, $3.50).

Fish's American Manual of Parliamentary Law (Harpers, 50 cents).

Woodworking Tools and How to Use Them (Ginn, Heath & Co., 50 cents).

Blaikie's How to Get Strong and How to Stay So (Harpers, $1).

Hunt's Hand-Book of Light Gymnastics (Lee & Shepard, 50 cts.).

Appleton's Home Books (11 volumes, 60 cents each), covering the following titles:

Building a Home.
How to Furnish a Home.
The Home Garden.
Home Grounds.
Amenities of Home.
Household Hints.
Home Decoration.
Home Amusements.
The Home Needle.
Home Occupations.
The Home Library

CHINESE COMPETITIVE EXAMINATIONS.

By the Rev. Dr. E. WENTWORTH, of Sandy Hill.

The theme assigned me on the programme of this occasion is an extensive one — "Chinese literature, language and education." As only a brief portion of this wide field can be surveyed in a thirty-minute paper, I propose to restrict myself to a few desultory notes, chiefly on the Chinese system of competitive examination for civic place and literary honors.

Those who wish full knowledge of the origin, nature, scope and value of Chinese literature will find all they want in Legge's translations of the classics.

Full accounts of Chinese education, and especially of the celebrated triennial examinations, may be found in Williams, Doolittle and Martin, three eminent American writers, all of them thorough Chinese scholars, who give their views from three different and widely separated points of observation.

S. Wells Williams, LL. D., professor of Chinese in Yale and now partially paralyzed, a pioneer missionary, gave the world his "Middle Kingdom" in 1848. This classic in Chinese matters is to be reissued this fall and brought down to the present date. His point of contact with the system was Canton, the New Orleans of the empire, where he went from the polytechnic institute of Troy in 1833 to superintend the printing department of the missions. While Horace Greeley at the age of twenty-two was starting in New York the first penny daily ever issued, Williams, a year younger, was entering upon his life work of making his countrymen acquainted with Chinese literature, language and customs. His last station was Pekin, in the office of secretary of legation, 1862. As a full and careful authority on Chinese educational matters Williams is unsurpassed.

"Doolittle's Social Life in China," Harpers, 1865, was written at Foochow some hundreds of miles north of Canton, among a people speaking as different a language from that of the Cantonese as French is from Spanish or Portuguese from Italian. In the eighteen provinces of China one finds as many languages as in Europe, each based, however, upon the mother tongue of the country. One has only to go from Canton to Shanghai, or from Amoy to Pekin, to find himself as little understood by the natives as a Yankee would be in Holland, or a Britisher in Berlin. Mr. Doolittle devotes three chapters of his first volume to Chinese education.

The third American work and most recent of the three is that of the Rev. W. A. P. Martin, D. D., LL. D., "Education, Philosophy and Letters of the Chinese," Harpers, 1881 — a republication of articles that appeared in the *North American Review* and other periodicals some dozen years ago.

Sent to Ningpo in 1850, Dr. Martin was transferred to Pekin in 1863, where he became president of the Anglo-Chinese college in

1868, enjoying by this means unrivaled opportunities for becoming acquainted with the national system of education at its fountain head.

The books of these writers with others from European pens are found in every well selected library, and full articles appear in all the recent cyclopœdias, which supply exhaustive accounts of the same subject. That of Dr. Wylie, an old Shanghai acquaintance of mine, in Appleton's new edition, is particularly full and valuable. My own acquaintance with the system was formed by personal observation in the years 1855 to 1862, at Foochow, the capital of Fo ke-en, a province that lies on the east coast, abreast of the island of Formosa, containing 53,000 square miles, being a little larger than New York which contains 47,000, and having a population variously estimated from native censuses at 8,000,000 to 15,000,000.

THE EXAMINATION HALL.

In the winter of 1859, with a pocket compass and a hundred-foot tape-line, I made a rough survey and map of the city, the walls of which are about six miles in circuit, and are supposed to inclose a population of half a million. In the north-east corner of this walled metropolis, in an intramural, suburban, quiet quarter, I found the noted provincial Examination Hall. It was an inclosure resembling in shape and dimensions an American fair ground; a rectangle of twelve acres, surrounded by a high strong wall of brick or pounded earth, outside of which, at the distance of twenty feet, is another wall, equally solid, which with the massive front gates, thick and strong, give the whole place an air of State prison sequestration and security.

The broad front portals open upon a wide street or paved alley-way that runs straight through the middle of the level grounds to the distant rear wall. From this distant main aisle branch off, right and left, narrow alleys bordered by thousands of little cells, mansheds in fact, shaped like the horse sheds of a country meeting house, adapted to human size. In each narrow alley you may count some sixty of these compartments, each three and a half feet wide, three and a half feet deep, and six feet high, covered by a long and common rope-walk roof of tiles, and separated from each other by solid brick walls, open to the south, with no door and no protection from sun and rain. The occupant of one of these cells sits with his back to the rear wall, on a plank grooved into the brick work, having before him, higher up, another plank also grooved into the solid wall, to be used as a writing-desk or dining-table, while the other serves him for a seat by day and a bed by night.

When I first visited these rough quarters they were in a dilapidated condition, covered with dirt and overgrown with grass and weeds. Once in three years they are put in repair, cells whitewashed, weeds and grass removed, and the area, so long the abode of silence and desolation, becomes, like the annual fair ground, suddenly alive, tenanted with thousands. Once in three years, in mid-

September, the provincial capital is gay with the access of thousands who have come to attend or witness or assist at the triennial test, like throngs that flock to races or a public exposition.

A two-storied building in the center of the grounds is the headquarters of the chief examiners, two imperial commissioners sent from Pekin, who are attended by a small army of local officials, readers, scribes, runners and copyists. They are here to test the capacity of 8,000 or 10,000 men, assembled at this Albany of the province, to try for the second or Master's degree.

THE CANDIDATES.

Into the nine or ten thousand cells, on the morning of the appointed day, file these candidates, each to an assigned number, each bearing a roll of paper, pencil and inkstand, a lunch-box, a charcoal furnace, if he does not choose to depend on the public cookshop in the rear of the grounds, his teapot and inevitable tobacco pipe.

Here, young and old, sick and well, father in one cell, son in another, perhaps grandsire in a third, they are shut in for three trials on three days, guarded by sentries who patrol the aisles and alleys and the space between the inner and outer wall, while the outer gates are locked and sealed and every precaution taken to guard against fraud or surreptitious aid from within or without.

The themes distributed are drawn from the sacred books of the Chinese, nine to thirteen in number, given to the public in Legge's translation. They range from Mencius and Confucius, 300 and 500 years before Christ, to an antiquity that is as far removed from Confucius as Confucius is from us, away back to the borderland between myth and history, at least 5,000 years ago, whence issue also the Vedas of India and the earlier annals of Egypt and Assyria. Three *ex tempore* prose compositions and one poetical are exacted from each of the candidates at each of these sessions, accurate in historical statement, forceful in argument, elegant in style; in short, perfect specimens of composition of the classic mode.

THE GRADUATES.

Out of these thousands of essays the examiners select a few hundred and reject all the rest. Two or three hundred out of 10,000 may survive this severe ordeal. Those who do may have their names posted conspicuously on bulletin boards, saluted with salvos of cannon and no end of *feting* and rejoicing. Their names will be sent to Pekin to be gazetted, and they themselves may follow at public expense to compete with thousands from the other provinces of the empire for the third degree — that which corresponds to our doctor of laws.

In Massachusetts every chief magistrate, except the present incumbent, is made doctor of laws, because he is governor. In China he only is made governor who is already a doctor of laws.

When a man embarks on a literary career he never gives over the pursuit.

Martin tells of one man, an A. M. in his own province, who competed at the capital seven times in twenty years for the higher degree, won after he was sixty, and was rewarded for his perseverance with the mayorship of Pekin. With a population of 400,000,000, China, in its eighteen provinces, admits about 2,000,000 candidates to government examinations every year, and passes only one or two per cent of these. By this impartially sifting process the government secures the highest scholarship, the best talent, the brightest minds, quickest, strongest, most intelligent for its highest offices. Below these A. M.s there are thousands upon thousands of A. B.s graduated at the country examinations, who are left behind in the higher race to fill the lower offices of scribes and teachers, justices of the peace, village supervisors, constables and county offices. In the absence of newspapers official proclamations are posted on bulletin boards and blank walls, and these semi-literary scholars daily do the populace a good turn by reading aloud to the millions who cannot read.

THE CHINESE CURRICULUM.

Schools are common in China, but they are not like those in Christian countries, for the education of the masses. They are simply the route to and the qualification for civil office as, in the United States, a lad or two in each representative district may be found qualified by rigid competitive examination for West Point or Annapolis, leaving thirty of his competitors in the lurch. So, Chinese government examinations, while giving every boy in the community a chance secure only the highest and best. The policy is exclusive rather than inclusive. It tends to a minimum. Education is not valued for its own sake, but is pursued for a pecuniary end. The graduate, even in the lowest degree, is a man of mark in the community. He enjoys privileges and immunities not granted to the ordinary civilian. He only becomes a high officer who stands highest in scholarship. What does that scholarship imply? Simply an acquaintance with his own literature. The Chinese *savant*, "sin-sang" he is called in his own tongue, knows no ancient tongues, nothing of algebra, geometry, physics or higher astronomy; no geography outside of the "Middle Kingdom;" no history except his own dynasties; no letters but his own hieroglyphics. In these the sin-sang is prodigiously learned. The language itself calls for years of elementary drill. To memorize 44,000 characters, the number catalogued and defined in Kanghi's dictionary is a work of years and superhuman labor. In 1814, William Milne wrote: "To acquire the Chinese is a work for bodies of brass, heads of oak, hands of steel, eyes of eagles, hearts of apostles, memories of angels and lives of Methuselah!" This extravaganza of a distinguished pioneer missionary is true only relatively. It

applies mainly to the written language and the monosyllabic character. The popular speech, unwritten for the most part, despised by the *literati*, as the learned of Europe despised the vulgar tongues when French and Latin were the vehicles of diplomacy and courts, is found by experiment to be simple, having far fewer vocalizations than the English, and no sounds more difficult than the German ü and tsayhah, the nasal twang of the Frenchman, the rolling "r" of the Spanish and Italian. The monosyllabic classic is the only one the learned sin-sang cares to master, and in this he strives to express his thoughts in prose and verse with lightning rapidity, every thought a pearl, and every sentence condensed as a telegram. In his own way the Chinese mandarin is the most learned man in the world. If a civilian, he rivals Bismarck in shrewdness; if a cloistered scholar he outdoes the German in learned research, piling up whole libraries of recondite commentaries. The book wealth of China is surpassed by that of no nation, useless for the most part as the mass of theologico-metaphysics of Christian lands. The degree of the literary man represents precisely what it has cost in labor. He has climbed what Martin felicitously calls his "nine-storied literary pagoda," with painful struggle from story to story, to find himself at top with a mere handful of those who entered with him upon the ground floor; and now he can govern provinces, go on embassies, make books, stand in the imperial presence with the proud consciousness that all that is due, not to wealth, influence or aristocratic birth, but to his own grit and industry.

THE AMERICAN SYSTEM.

How does this system compare with ours? We find between them no common measure, only slight grounds for just comparison. The objects and the modes of study are alike different. We pursue culture for culture's sake, the Chinaman gains education for offices' sake. His method of study is singular. For the most part it is solitary. Colleges there are, but efforts at labor-saving class arrangements by government endowed colleges have been, for the most part, conspicuous failures. Professors in the government institutions draw their salaries from the imperial treasury and lecture to empty benches.

With us time is an element in college study and graduation. The Chinese competitive system compels no man to "keep terms." He graduates when he is ready, whether he has studied ten years or two.

We adhere to the class system; the man is merged in his class. The solitary cell recognizes the individual and ignores the class. With us lessons are assigned and examinations conducted, scaled not to the ability of the foremost, or to the inability of the feeble, lazy and lagging, but with a constant reference to class average. The Chinese student assigns his own task, is responsible to no tutor, is spurred by no class emulation, no hope of rewards, no fear of demerits. His hopes and fears center in the grand triennial. Imperial examina-

tion papers are not, like those of college and university regents, adapted to age and average capacity. There is none of the labor-union solidarity which says, menacingly, "graduate the whole or none."

College standards may be higher than formerly, but it is only the raising of a class average. The system is *in*clusive of all it can hold, and not, like the Chinese, *ex*clusive of all but the very *crême de la crême* of society.

In the same spirit with the sneer "Who reads an American book," it used to be asked "What are the requirements at an American college?" and the answer was, "Stay in college four years and pay your bills." We have reason to believe that the cost of a bachelor's degree is something more than this at the present day.

The Chinese mode of competitive examinations by written themes has been imitated in the west, within a generation or two past, and examining university boards test the labors of the schools and colleges everywhere. The University of London "examines 1,400 annually, and graduates half that number."

The method of the Regents' Board of this State is adopted by colleges, and the bachelor's degree, doubtless, represents more hard work and honest labor than it did in the days when oral examinations enabled the kindly professor, by adapted selections and leading questions, to give even the dullest a chance to squeeze through. Taking into account preparatory and collegiate tests, I am not sure but the western bachelor's degree costs as much now as the eastern. But how about the higher or master's degree? On what terms may the college A. B. have his A. M.? The usages of institutions differ, but the general impression is that absence from college three years (no matter how employed) and five dollars to the prex will readily secure to any one who desires it a second sheepskin from his *alma mater*.

Bachelor of arts is a modern designation. So is the Chinese "Seu Chai," — flowering capacity or talent in the bud. Master of arts — *artium magister* — is a vastly more pretentious title. It asserts *mastery* of the whole circle of the liberal arts, familiarity with the entire range of the "humanities," the whole of the old trivium and quadrivium with all their modern addenda, complete scholarship. Right at this point, where the western student is declared a man and master, the Chinese pupil, culled out from thousands of his disappointed fellows, writes himself "Kü ing," or, more modestly, "Kü-chü," a "promoted child," master as yet of nothing but only "*deserving* of promotion" in view of his previous success and industry. Only when he has, in company with a mere handful of others, distanced some millions of his peers does he proudly write himself "Ching Seü," "advanced scholar," "fit for office."

OUR COLLEGES.

How do the honorary A. M.s and D. D.s and LL. D.s, flung about so promiscuously at our annual college commencements, com-

pare in worth with these hard-earned awards to genuine advance and honest labor? Is there any available mode of making a college degree of more worth than it is at present?

The upheavals of these democratic ages have given the old mediæval college ideas a rude shaking. It is queried whether four years' delving in one's own language, literature, history, laws and annals would not be better than so much grubbing among the dry roots of dead tongues. This is the Chinese mode, and this, evidently, would please some of those who would reform the college curriculum and methods. The revival of learning in the fifteenth century aroused renewed attention to the Hebrew scriptures and the languages in which they were written, and Greek, Latin and Hebrew were added to the trivium and quadrivium. Now, it is urged that it is no longer necessary to retain these essentials to theological training in the schools of liberal arts.

The accession of a multitude of new branches of learning, physical and social sciences, has made havoc with the olden time curriculums. At the opening of the century Yale and Harvard had each a president and three professors, with a staff of tutors; now, not an institution in the land that calls itself a college but what has ten or more professorships in the liberal arts.

Formerly the college was the only gateway to the learned professions, and these were three and three only in number — law, medicine and divinity. Common school life terminated at fourteen. One boy in a family went to a trade and served as apprentice seven years till he was twenty-one. Another boy entered college at fourteen, graduated bachelor at eighteen, studied his profession three years and entered upon life also at twenty-one. The exigencies of life on a new continent made every man his own carpenter and shoemaker and smith, and broke up the apprentice system. The same exigencies sent him from the plow and the anvil to the bar, the pulpit and the sick chamber. Colleges lost their prestige. The business of life is to get a living. At this business non-graduates, it was found, succeeded as well as graduates, perhaps better. Why spend years of time and thousands of money to reach that which could as well be reached by the shorter route? Graduates of the common school have climbed like Lincoln to the presidency of the Union. Of late years the academies have usurped all the functions of the college. They have their presidents and professors, their classical and scientific courses, their freshman and seniors, their anniversary work, baccalaureate, university sermons, oratorical and rhetorical contests and prizes, their class reunions, commencements with salutatory, honor orations and valedictory, their degrees and parchments with red seals and blue ribbon, their president's levee with bouquets, and bands, and lemonade, and ice-cream, cake and strawberries. Judges, ambassadors, governors call themselves "alumni" of this or that "academy or institute." Colleges themselves have created scientific courses and short cuts to the discredit of the old system and regular course. Colleges of yesterday, not

content to creep before they could go alone, have commenced life as universities, with neither money nor men; some of them in buildings of logs and rived clapboards, amid the stumps and clearings of new settlements. Government millions may create a university full-fledged, like the Berlin, but it will still want, like wine, age to give it the true university flavor. It is evident from what we see in all parts of the land of debt-spavined, struggling institutions, with few students, and constant effort needed to keep a perishing concern above water, that legislative enactments and the bequests of wealthy benefactors cannot create universities.

OUR "UNIVERSITIES."

It is matter of regret that the infant institutions of this infant country did not content themselves with the name college. Of the four hundred institutions having collegiate powers and charters, full one hundred assume the title "university." It is worthy of note that this ambitious cognomen is particularly affected by the corporations most recent in the educational field, institutions, few of which are in possession of adequate means, and fewer still located in populous regions or literary centers. The colored brethren, close imitators of their white models, and, like the uneducated among them, apt to exaggerate what they imitate, have seven or eight "universities," the growth of the last fifteen or twenty years, most of which, we must suppose, can hardly rise above the grade of preparatory schools. Out of seventy collegiate institutions our Roman Catholic friends have named but two "university," and one of these is the old St. Xavier, located in the populous Mound city, now called St. Louis University. Of the twenty-two colleges of this State reporting to the Regents, some eight call themselves "universities" having six to fifteen departments of instruction, and usually in no wise to be distinguished from colleges except in name. Not one of them has a full university faculty. In all, as reported, there is a conspicuous absence of that which constituted the chief of the learned faculties of the old *régime*, the theological. The law school, the medical school, the school of mines, the school of agriculture, of music, of dentistry and veterinary surgery appear, but the school of divinity is wanting, and without that the European can imagine no complete university course. It is this that constitutes Yale and Harvard universities in the true sense of the word, though small affairs compared with Cambridge and Oxford, the growth of eight centuries, the fruit of the accumulated wealth of kings, bishops and nobles, church and State millionaires of twenty-five generations.

American colleges rank with the German gymnasia, training schools for the university proper. Of old, colleges recognized that prime principle of political economy, division of labor, and restricted themselves to the preparation of youth for the professional course. The curriculum of the common school, the high school, the village academy, the college itself, was each distinct, narrow, well worn and deeply-rutted. Among the things that conspired to change all this

in modern days was the fact that woman desired liberal education. She could not have it in the colleges. Mixed seminaries were created about fifty years ago which marked out semi-collegiate study-courses, and issued diplomas to the gentler sex, since they could get no other. Woman can now, as well as man, make her way to either of the learned professions by the way of the college proper.

The influx of the sciences has broadened the course, crowded it for time, and the ambition to get too many things into a four years' course is creating superficiality in all. By doing or undertaking to do too much nothing is done well.

The scholars of the last century read Greek fluently, as does the celebrated New York Greek club, without translating, and conversed in Latin like natives. In these days the learned languages in colleges, particularly the Greek, are reduced to a minimum. The junior Charles Francis Adams is the only American I ever heard of, in this century, that, even at Harvard, got Greek enough to hurt him!

THE USE OF GRAMMAR.

What has been said over and often is that the use of an elementary course is not so much to impart knowledge as to teach youth how to use its powers. In the infancy of the dawning faculties memory is one of the first to be developed and strengthened. Immemorial experience has shown that for this purpose language is best adapted. The China boy learns at the dictation of a teacher whole volumes and pages of characters of which he knows not the import, dry and meaningless as scales and exercises to beginners in music, as if an American boy should be taught Virgil by rote without translating a single line of the poem. In due time this dry and severe regimen brings forth its fruit in singular power of memory. The elements of grammar are the best unfolders of the mental faculties before youth has learned to think and reason consecutively. Mastery of the Latin grammar is the shortest cut to the understanding of the English and especially of the romance tongues. German is undoubtedly the best route to a full understanding of the Saxon side of English, but as a mere grammar exercise, a bare grammar knowledge of any language, I would as soon have a son of mine study a dead tongue as a living one, as soon Greek as German, and so far as exercise in the elements is concerned as soon Chinese as either.

THE LITERATURE OF LANGUAGE.

The literature of a language is another thing. No doubt pupils often get disgusted with Greek by being forced to use its finest poetry and its greatest rhetorical masterpieces as school exercises, known to the reluctant student only by the wretched translations of the recitation-room! Every one should have Greek and Latin enough to be master of the terminology of the round of modern sciences. In this presence these assertions are familiar truisms. People outside, and especially the press, so often in the hands of non-

college graduates, should know that there is still apology for the old and narrow course, the first effort of which is to discipline the mind to study, then to impart general ideas, then to put the muscle, trained in this elementary educational gymnasium, on the track of the professional career it is to pursue through life. Such a course will make the best scholars and most of them in the end. After a ten years' experiment with a course that excluded the ancient tongues as a preparation for the universities the Germans are reverting to the old mode, convinced by actual experiment that it makes students more thorough and better equipped for the university course than those prepared by the new method. Milton and Addison, both superior classical scholars, Cowley, Byron, Herbert Spencer and a hundred others, have had each his fling at the classics, but they still maintain their place both as superior training ground for the youthful mind and as the repositories of the grand, the beautiful and true, and above all, with the Christian world as the chosen vehicles of the oracles of God, in which live and glow the words of the world's Redeemer and the story of the cross.

The college is still the best and shortest route to the university. But what is a university? A collection of colleges, the college of the liberal arts — the "humanities," — the college of divinity, the college of medicine, the college of law, with all the added colleges of modern, social, scientific and mechanical and artistic vocations.

In this view where are the universities of America? A university proper needs as many separate faculties as there are departments. Some conceive of it as a sort of Stewart's, where, under one roof, you may have any thing, from a spool of cotton to a wholesale bill of dry goods. With some the idea seems to have been that a university is less than a college, that the name could be appropriately applied to those frontier schools that could not yet aspire to a college course, with its full faculty, regularity and drill. With others it is a sort of go-as-you-please college, full of elective courses and entitled to be called a university in view of this electivity. This was the mercurial Jefferson's pet ideal, and has found expression in all sorts of schools in this country and Europe during the present century. Oxford and Cambridge — university towns — have each eighteen or twenty colleges, each of which has its own corps of teachers and staff of professors, its quadrangles, gardens, libraries, halls and students. What these celebrated towns have the State of New York became possessed of nearly one hundred years ago when the fathers, in their wisdom, erected the colleges of the Commonwealth into a State University. If this magnificent idea had been fully carried out, this would have been the only university in the State, and my friend Pierson would, at this moment, have no rival as Chancellor.

NEW YORK STATE UNIVERSITY.

The twenty-two liberal art colleges of this university, though distant from each other, are, in this telegraphic, telephonic and railroad age, nearer to each other than the colleges scattered over Cambridge

and Oxford were to each other half a century ago. Steam and lightning have annihilated time and distance, and the spirit of the age has softened social, national and religious asperities and removed jealousies and antipathies, till there is nothing in the way of the *real* and not merely nominal consolidation of the separate colleges of this Empire State into a *university* that shall rival Oxford or Cambridge, outstrip Yale and Harvard, and be equal to the competitive examination halls of the celestial empire.

The Board of Regents has the academies, high schools and union schools of the State well in hand. They do their appropriate work in examining students in all the academic grades, and their diploma is a card of admission into any college of the State. The true university idea requires their co-operation in the annual examination of *all* college classes as well, and their co-signature, through their president with that of the college officers, of all diplomas issued.

This would make the bachelor of arts a graduate, not of Columbia, or Union, or St. Bonaventura merely, but of the University of the State of New York. The Regents' diploma is now in high standing with all the academies of the State. The Regents' co-signature of a college diploma should give that diploma as high a relative value in all the colleges of the State. With this union accomplished, we have not yet reached the Chinese ideal of provincial or State graduation. There remains beyond competition for the master's degree.

THE HIGHER DEGREES.

The colleges of this convocation in connection with the Regents should formulate and publish a curriculum, embracing a three years' course of studies, some elective, some professional, on which they should issue examination papers, to be distributed over the State to the colleges and schools at given days in the year, when any one that chooses, who is already a bachelor of arts, may enter the lists and compete for the master's degree. With a high standard, and thorough and impartial examinations, the graduates of this course would stand highest of any in the collegiate world. Instead of the slip-shod mode in which the higher degrees are now granted on slight recommendation, personal favor, hope of patronage, influence or pecuniary considerations, all applications for higher degrees should be submitted to a senate composed of members of the Regents' Board and the college faculties, which would give to a D. D. or LL. D. of the New York State University a value which they cannot possess while honorary degrees are as cheap as Indiana divorces! Analogy with the Chinese system would grant such degrees only to those who had taken all the lower steps, and these would be the price of personal examination at the State or National capital.

A pet idea of some has been to erect a great National university at Washington. A teaching college of any kind would immediately degenerate into a school for the instruction of the boys of the District of Columbia, as any city college is for the boys of that city. A series of lectures could be inaugurated there, but would have no

advantage except that of being out of the way of everybody and of no advantage to dwellers in remote parts of the Union. What might be made at Washington is a Regents' board of examiners for the Union. There is splendid material for the institution of such a board in the officers of the Smithsonian for the scientific and natural history department, the National observatory for the astronomical, the secretaries for civil service, the judges of the supreme court for the legal. An LL. D. emanating from such a source at the heels of successful examination in papers submitted for competitive trial would be worth the while of the recipient, and would equal the Washington university with the celebrated French Sorbonne.

THE LEGITIMATE USE OF FICTIONS IN THE PROSECUTION AND DISCUSSIONS OF SCIENCE.

By W. D. WILSON, D. D., LL. D., L. H. D., Cornell University

It is a very common impression that science is based on facts — rests and depends on facts alone. Hence there is claimed for it a degree of certainty and precision that cannot be expected anywhere except in the natural sciences. All else is relegated to the domain of speculation and metaphysics, in which absolute certainty and well-defined knowledge is not to be expected, and an unlimited amount of fancy and liberty of conjecture and speculation are to be allowed.

Now, so far as the basis of facts is claimed for science, the claim is most assuredly true, and it is well founded. But then, there is and must be a use of fictions also; and the fictions are very apt to get mixed up with the facts and mistaken for them, often making sad work with what we had supposed to be science. The *Facts* exist and have a substantial existence outside of the mind of man, and independently alike of his will in creating them and of his intelligence in recognizing them. In a sense they constitute the domain of nature. In another sense they are the creations — or creatures — rather of God.

The *Fictions* exist only in the mind — are its creations or creatures and depend on the will and the intelligence of man for whatever of existence and of reality they can be said to have. They are *man-made* and are, or can be so made, as to serve his purposes for science or for poetry — for the declaration and elucidation of truths; or for the promotion and perpetuation of error and delusion either according to his wish or to his misconception of their nature.

I think we may refer all the facts that come within the domain of knowledge to three classes, which are distinguished from each other, as well by their essential nature as by the methods and the means by which we gain our knowledge of them. One class includes all material objects — all the objects in the outward world. The second class includes all finite minds or souls and the third, if it be a class at all and includes more than one object, includes the Infinite Mind, or God. Thus, considered from a purely objective point of view, we have three classes of objects within the domain of knowledge. And if we look at the matter from a subjective point we come to the same result. These objects are all known as causes, and our knowledge of them — indeed our knowledge of all existing objects and facts rests and depends on the one principle of causation in its three-fold application.

The *first* class includes all *material* objects. They are known by sense-perception, so far as they are immediately known. But in sense-perception they are known only as the causes of those sensations by which we perceive this.

The *second* class — minds — we know primarily, each one's own

mind to himself, by those acts of thought and volition which they cause in him of which he is conscious in himself, and which he finally comes to ascribe by analogy to other persons.

The *third* class consists of objects whose existence is proved, as I think only by a process of reasoning from effect to cause based upon what we know of the objects that are included in the two first-named classes, but with no such immediate cognition as we have in the case of objects that come within those classes.

Objects of the first class are necessarily of a *material* nature. Having what we call sensible properties.

Objects of the second class are necessarily of a *spiritual* nature and can be known only in performing such acts of cognition, memory, will, etc., as occur within us and belong to mind only.

But objects of the third class may be either material or spiritual in their nature. By this method the planet Neptune was first discovered and yet it is a mass of matter of immense magnitude. In this way the ether which is believed by most scientific men to pervade all space — must be proved to be a reality, if indeed it ever is or can be proved to be a real entity.

And in this way, and by this method, we prove the existence of God — the Infinite Mind or Spirit of the Universe, first as first cause, and then as Spirit or Mind, as that only is adequate to the phenomena by which we prove his existence.

If now we run over and over the pages of any book that claims to be a book of science and not one of poetry — of professed fiction or of pretentious metaphysics, and mark, with a pencil, any name that denotes either (1) a material object or a class or group of such objects; (2) the mind or soul under any of its names — or (3) the Supreme Being — we shall find a large number of names left — that cannot be referred to any one of these classes. At first sight many of them will be recognized in "abstract terms;" denoting mere qualities or properties of objects. But, on a little further consideration we shall see that a large number are used to denote something more than a mere abstraction — they have been erected into fictions and made to do a duty that is peculiarly their own.

It is my object in this paper not only to point out the difference between the two — facts and fictions — but also to assign the proper limits to the use of fictions.

I will illustrate my view by referring to a few obvious examples, before proceeding to those that are more doubtful.

I refer first to geography. Take for example the equator. It is described as an "imaginary line." Much the same may be said of the "parallels of latitude" — the "poles" of the earth and its "axis." We locate places by them. We measure distances from them. And yet they are purely imaginary — fictions and nothing but fictions — they are not even properties of any thing, they are not in fact so much as abstractions. But after we have once defined them as "imaginary lines," we go on to use them and speak of them as if they were as real as the rivers and the mountain ranges that are the real objects of scientific interest and inquiry — to the student of geography.

I turn to mathematics for another illustration. We speak of "the unit" — as of something existing without properties that can distinguish one from another. As such it is of course but a mere fiction — and yet the fiction or the "conception," whichever we may choose to call it, is essential to all our discussions of the science of numbers.

Turning to another branch of mathematics — we have "the point" and "the line." We speak of "the point of a stick" — "the point of a pen," etc. But a point, as such, exists nowhere. What we conceive or what we create as a fiction, is something that is supposed to be somewhere and may be anywhere in space; and yet it does not occupy any part of space — has in fact no extension or dimensions in any direction, it is not the *point of* any thing. We could not begin our geometry without this conception — and yet it is only a fiction.

Much the same may be said of "the line." It is conceived to have extension or dimensions in one direction only. It has, or is conceived to have, no other property — as thickness, color, etc. And yet without some other property than mere length it cannot exist as a reality anywhere, whether in space or out of it.

When we approach analytics in the calendar these two fictions — the point and the line — are made to serve other excellent and most indispensable purposes. We may now suppose the point to have dimensions varying in size as it enters any new discussion. With this view of the point a line may be considered or made up of points — a series of them in contact with each other and extending in the direction that is determined by the motion and the law of the time. Hence, we can represent a line, not now as in geometry, by the two letters A B, or C D, which are really its name, but by the algebraic symbol a, b, x or y, denoting an unknown but supposed number of points, and proceed to manipulate our equation as if we were dealing with mere numbers, or rather with their symbols — and whatever result we thus obtain algebraically will be true geometrically, of the lines, surfaces or solids that we indicated by our algebraic symbols when we began our operation.

So far as the purposes of geography and astronomy are concerned these fictions serve, for most persons and most purposes, just as well as facts or realities could do. It is possible that for persons living near "the equator," or for those who may happen to be traveling in that region, it would be a convenience, at least, to have for an equator something real, something that could be recognized, seen or felt when we get near it. But for all other purposes, these fictions, the equator, the parallels of latitude, the poles of the earth and its axis, and such like fictions, are just as good for all the needs of science and all the convenience of scientific discussion and investigation as the most substantial realities could possibly be, and in fact in every respect they are better than real objects.

And in mathematics the fictions are in all respects better than facts. They enable us to make the science *wholly* abstract, and thus

absolutely true. We make the unit, the point, the line, etc., just what they need to be, *in order that* there may be no accidental or variable matter in our discussions. What we thus obtain, as a result, is absolute truth, true always and everywhere, absolutely true. Uncertainty and doubt, or the possibility of doubt, arise only where we come to apply these truths to concrete facts and actual cases. In computing the effectiveness of a machine, for example, we have to make allowance for the friction that is unavoidable. In looking for the result of a mass moving in any orbit or trajectory we must take into account the resisting medium, if there is any, and the disturbing forces that may cause perturbations and either accelerate or retard the moving body.

But the truths, so far as pure mathematics goes, are absolute and exact. And it is of inestimable value that we have such truths as a starting point, a base of operations in all branches and departments of science, and of practical knowledge. And for this purpose the starting points, the unit, the point and the line, etc., must be ideal fictions in order that they may be perfect and perfectly answer the purposes of science. No known or possible reality will answer the purpose.

What I have been saying thus far has been designed chiefly as an introduction to prepare the way for what I wish to present as the main topic of this paper. And thus far, I presume, I have excited no surprise, and have not said any thing that will occasion dissent from the views I have expressed. But in what is to follow I do not anticipate so ready an acquiescence.

In speaking of material objects it is customary to speak of them as "substances having properties." But are not the "properties" in this expression mere fictions? I see this paper, it is white — the paper is a reality. But the whiteness? is not that a fiction? In describing objects and in speaking of them, we could hardly speak at all without the use of these fictions which we call "their properties," as showing the character and relations of the objects themselves.

But are the properties so-called things that can "*be had?*" Is there any act of "*having*" in the case? The paper *is* white and it *is* hard; but *has* it whiteness and hardness in any proper sense of the words "to have" or "having?" I have this pen. But I am one thing and the pen is another. It would exist if I had it not. Some one else might "have" it, or it might not be "had" at all or by anybody and yet exist somewhere as really and as substantially as now. Not so with a mere property, however. It is always the property of *something* and not one thing "had" or capable of being "had," in any proper sense of the word, by any other thing. Substance and property are not two things the one of which can "have" and the other "be had."

But are not the properties realities some one will ask? *As properties* they are doubtless real, that is, this paper is really white and hard; the orange is really round and sweet of flavor. But are

not both "substance" and "properties" mere fictions invented for the convenience of expression and of speech in speaking of and describing objects, as truly so as the equator, the axis, the poles and the parallels of latitude that are used in geography for the purpose of indicating and describing the location of places and the direction of motion?

Every object that can be seen or felt by touch and compression is a reality — and a substantial reality. But when we speak of them as made up of substance and properties we are inventing fictions or adopting those that have been already invented by others. A substance *in this sense*, that is, a something without properties does not exist, cannot be conceived of as an existing reality any more than the properties themselves can be considered as existing, without the substance of which they are properties.

The distinction is easily made. We can neither conceive or think of a "substance" without "properties" or a "property" without a "substance" in the common acceptation of the terms. But the substance is supposed to be that which can exist through almost any change of properties or relations; while the properties, properly so-called, cannot be said to *exist* everywhere; they are the mere appearances or aspects of the substantial thing itself.

Let us turn our thoughts for a moment to the two great branches of knowledge and see what part the fictions play in the discussion and elucidation of the facts on which these branches of science are built.

More than fifty years ago Victor Cousin said, very emphatically, that there are but two classes of facts or realities — objects having a substantial existence or existing substantially, upon which science and knowledge can be based, namely (1), things in nature or *material* objects with their actions upon us — and upon one another — and (2) *minds* that are within us and their operations in consciousness.

Now in the study of mind we have invented two classes of fictions that seem, in the portion of the attention they have occupied, to have taken the place, to some extent, at least, in the minds and thoughts of the philosophers of the facts themselves.

Plato invented one class of these fictions, which he called ideas. Dr. Thomas Reid said, more than a hundred years ago (1764): "When, in common language, we speak of *having an idea* of any thing, we mean no more by that expression than that we *are thinking of* it. But besides this the philosopher conceives of an *idea* which is the *immediate* object of thought. The *idea is in the mind itself*. But I believe *ideas* taken in this sense are a mere fiction of the philosophers." And this is precisely the doctrine that Cousin affirmed so emphatically and with such reiteration fifty years later as the accepted doctrine of modern philosophy. And even the German Zeller, in his History of Philosophy, vol. VI, p. 18, says: "The 'conceptions' or 'generic forms' of Aristotle and the 'ideas' of Plato which these philosophers regarded as most truly real, are, after all, but fabrications or fictions of the human mind itself."

Aristotle, the contemporary and disciple of Plato, had taken the same view of Plato's ideas. See Metaphysics, B. I, ch. ix, § 1; B. XII, ch. v.

And yet we cannot discuss psychology and logic without the use of these fictions. We must consider knowledge as a vast collective whole, made up of ultimate parts or atoms, which we call ideas. These ideas are supposed, and *created*, to represent things, one for every object of knowledge, one for every class and species of objects, one for every collective whole, and one for every different view we may take of the same object, and one, in fine, for every property, relation or mode of activity that we may suppose the object to have.

Now these ideas, these mere fictions, under one name or another, as ideas, notions, conceptions, or some such name, sustain about the same relation to one great branch of logic — the branch that is sometimes called formal or pure logic — as the mathematical fictions, the unit, the point and the line do to the several branches of pure mathematics. All reasoning and all the syllogisms and formulæ of reasoning are explained and demonstrated and illustrated by means of these fictions. But some one will ask do you then deny the reality of ideas? If ideas are to be regarded as merely thoughts, they are, of course, real *as modes* or properties or states of the mind. But as distinct from or existing in the mind, they are mere fictions. Take the case of that much-disputed and long-controverted subject "the origin of ideas." If they are indeed facts, their origin is of the utmost importance to the settlement of nearly all questions relating to knowledge, in fact none of the questions can be satisfactorily settled without first disposing of this question, or assuming that it has been answered in some way — one way or another. But if they are mere fictions, the question of their origin has no practical importance whatever, they had no origin worth inquiring into; and the only questions of importance are how did the mind come to think of such and such things, or in this way rather in that or in some other about them after it has once cognized them?

And this leads us to consider the mind itself, its motion and mode of operations, which is the grand reality in the case. And are not ideas in this sense of the word and this use of them even, pure fictions, as Reid said they were? I suppose that no one, when he has his attention fixed on the subject, and has considered it long enough to understand the import of the question, will answer otherwise than as Reid, Cousin, Zeller and others have done.

The other great class of fictions that are used in the discussions of mental philosophy are the "mental faculties" or "powers," so-called. "Nearly every writer on mental philosophy," as has been well remarked, "begins his work by warning his hearers that the mind is a simple, uncomprehended, incomplex entity, but he ends in producing the impression that it is like the body, a collective whole, made up of faculties as the body is of organs.

Put the question directly and we find that no one supposes the

faculties to be real organs or entities — parts of the mind. The mind acts in one way and we call that kind of action perception; and in other ways which we call imagination, reason, memory, will, etc. We find it convenient to objectify these abstractions — erect them into fictions — and then speak of the memory, the imagination, the reason and the will, as if they were, like the heart, the lungs and the stomach, each a separate organ doing its own work and sometimes absorbing energy that belongs to another organ or working directly in opposition to it.

Now, so long as we distinctly understand that these so-called faculties are mere fictions and only fictions, and use them in accordance with this view, they not only do no harm, but their use is a convenience — it is more, it is a necessity. We can hardly discuss the subject or talk intelligibly about it without the use of these fictions. But when we mistake the fictions for facts we are on the way to endless errors and confusion and to utter unintelligibility.

The mind itself comes within our definition of realities. We are cognizant if not conscious of it in the acts of thinking and willing, as that which thinks and wills; just as we are cognizant of the external objects that produce the sensations in us by which we perceive them. But when the mind thinks it is the mind in a mode — and the mind and the thought are not two things separate or separable. Nor does the mind produce, create or manufacture, so to call it, any thing in the process of thinking that remains as a reality in the mind, which we may call a thought. The mind thinks of one thing and then passes on to think of another; but there are no substantial realities produced that remain and which we can call thoughts.

I turn now to the other great subdivision of human knowledge, the natural sciences. These sciences deal chiefly with those properties of objects which constitute their relations to and their actions upon one another.

"The true *scientific* idea," as Tyndall has said, "is that the atoms, molecules and masses of matter are real entities and act directly on each other." That they attract each other and repel each other without, as he says, "the intervention of slave labor."

We perceive, by sensation, that one of those objects is hot. Tyndall has shown that this sensation depends on the kind of motion that is taking place among the atoms. Change the motion and the object will appear luminous, or electric, or magnetic, as the case may be. But in all cases the difference in our sensations depends upon differences in the mode and rate of motion among the particles of which the cognizable mass is composed.

So much for the psychology of the matter and of our *immediate* knowledge of what we call the properties of material objects.

But we see these objects acting upon one another. An object that is hot, as indicated in the sensations it produces in us, produces also effects upon other objects which are not of a sensitive nature and have no sensations like what we experience, which effects, how-

ever, it produces only while it is hot. It is only when iron is hot that it burns our fingers. It is only when the gas is hot that it burns and illuminates our apartments. It is only when what we call "the current of electricity" is interrupted that we see the spark or experience the shock.

Now, to assist in expressing our thoughts and in discussing the production and appearance of these phenomena we invent a class of fictions. We see that an object is hot. We imagine or fancy an entity which we call heat. It accords with our experience and observation — with observed facts and phenomena — to say that heat is produced by chemical action, by friction, or by condensation; that it is "radiated" from one object to another, or into space; that it is "reflected," "connected" or "conducted;" that it "expands most objects," "cements solids into a fluid state, and volatilizes fluids into an invisible gas or air." Being purely a creation of our own, we make it such as to suit our convenience. Just as we make "the equator" to surround the earth when it suits us best in a particular place and way, just as we make "the unit" in arithmetic to be an entity without ontological or sensible properties, and just as we make "the point" to have position without extension or dimensions in space, so we make heat to be just such an agent as we want, as a means of expressing our thoughts and our imaginings with regard to those effects which one material object produces in others, though very likely it may imply contradictions and absurdities which render its existence as a reality quite impossible.

If we accept Tyndall's doctrine, that the atoms, molecules and masses of matter act *directly* on each other, the so-called "forces" can be nothing but fictions; they are in relation to the *physical* sciences very much the same as the so-called mental faculties are in relation to *mental* science. They furnish a convenient nomenclature, and, considered in a practical point of view, a good working hypothesis to start with. But, theoretically, it is bad; for the moment we assume these forces to be facts, realities in the order of nature, we are off the track; we are dealing with the creations of our own fancy, while we assume to be and suppose that we are dealing with facts and objects that are of God's creating, and parts of the universe. He has made of these so-called "forces," modern philosophers reckon at least seven — heat, light, electricity, magnetism, affinity, cohesion and gravity. To these many, from a "biological" point of view, would add "life," "instinct," "thought" and "will." And the moral philosopher might go on and add to the list, such words as "truth," "virtue," conscience," etc. Nay, there are those who would include in the same category, the mind of man and even God himself; and the general tendency of the most recent speculations of some schools is to regard these forces, all of them, as but varied forms of the manifestation and activity of the one force, which is God. These philosophers would thus make the names which denote mind, and the Supreme Being abstract terms like all the rest I have named in this connection.

But, says one, do you mean to deny that these forces are not? Do you mean to say that heat, for example, is no reality and that this stove is not hot? The question in its two-fold form, or rather by its two-fold form, shows that the questioner has not yet understood or appreciated the point I have been trying to make. Doubtless the stove is hot — really hot, very hot perhaps — and the stove is a reality. But the heat is not a reality in the same sense, if, indeed, it can be said to be a reality in any sense of the word. The river Amazon is a very real thing on the face of the earth — a tremendous reality — but "the equator" which crosses it, or runs along its surface is no such reality as the river — it is not a reality at all; it is only an "*imaginary* line" — so heat and the other forces are only imaginary, somethings that are *supposed* to reside in matter in its three-fold forms, atoms, molecules and masses, to be radiated or sent from it — reflected, refracted or converted — and to do whatever we see the matter atoms, molecules or masses doing in or upon each other and other material bodies.

As we make these fictions ourselves, we can, of course, make them to suit our convenience, and to be in all respects such as we want them to be. Of course no two of them will be just alike, nor do we need to regard and observe the ordinary conditions of ontological existence. We can make them to have the properties of matter so far as to be able to act on matter *as forces*, and yet be without density, extension, form, or gravity, or any essential property of matter. We can suppose them to move through space; nay we have even determined the velocity with which some of them are supposed to move, as sound, light and electricity for examples. We have even invented or imagined — we can hardly say *discovered* — an ether through which and by means of which they pass in space. This ether, however, as Professor Cooke sometime ago demonstrated, must be, in order to accomplish the function assigned to it or rather for which it was invented, much more dense than the hardest steel, and many times more rare than hydrogen, which is rarest of all substances whose existence is actually known.

And yet these absurdities and incompatibilities do no harm, so long as we regard these entities — as fictions, pure fictions — creations of human fancy and imagination — like "the equator," "the unit," "the point," "the line," etc. Nay, I presume they will, all of them be found, on careful scrutiny to be such that their existence would involve an absurdity that could easily be resolved into a contradiction in terms.

The other great class of fictions in the physical or natural sciences are called laws.

We see that objects in nature, being inert, cannot of themselves and spontaneously start from a state of rest and inaction, if indeed they ever are in that state. They must be acted upon each one of them by something that is external and ontologically different from themselves. Nor being in a state of activity, can they of themselves vary the rate or intensity of that activity or change. The

earth, for example, attracts the moon with a definite force. If the earth were larger, the force would be greater; if the earth were nearer to the moon the effectiveness of its attraction would be greater. But the earth can neither increase its size, nor change its position, nor act with more force than it does now.

Now we find it convenient to represent some aspects of the phenomena that grow out of those facts, *as laws* — or as the product of law. And then we speak of the law of gravity, for example as controlling and producing the phenomenon of the activity of all material things — we say for example the law of gravity "pervades all space," "rules and controls all the phenomena of motion among the heavenly bodies;" and even on earth no material thing is exempt from its influence and control.

The thought is beautiful — it is poetical. In the early days of Aryan history it would have become a myth, and gravity would have been enrolled as one of the female divinities of their most elaborate mythology.

But of course on a moment's thought — we see — as all men, when they are speaking directly on the subject say, that law is but a mode of motion or action — the way in which the real objects in nature have been observed to act. But the objects themselves are the real agents, the real causes, and the knowledge thus gained is none the less valuable or trustworthy on account of its being thus expressed by means of fictions.

And it suits our purposes in more ways than one to speak of these laws, which are mere abstractions — abstract generalizations from observed phenomena — or from an insight into the nature of things themselves — as realities, and as the active causes or forces of the observed phenomena themselves, just as we locate places in geography by reference to the equator and the poles.

Bishop Butler more than a century ago spoke of the absurdity of supposing laws that could "*execute themselves*" — and all modern speculation has confirmed his view. And yet it would be extremely awkward, if not altogether impossible to speak of the observed phenomena of action without speaking of the laws of their occurrence as being in some sense realities, and not only realities but as causes, efficient or occasional, of their occurrence.

I have but two more fictions to speak of in this paper, and they are perhaps the two most universal, most general and most frequently in common use of all — they are time and space.

We cannot discuss geometry without supposing space. It must be something with dimensions, and yet without solidity — something in which objects can exist without diminishing or limiting its quantity or extension — for it is, supposably, infinite; something through which objects can pass without friction, obstruction or retardation of their velocity; something in which "points" can be placed, "lines" drawn, and "surfaces" projected, and changes of form take place.

It is thus a most convenient submission, and, if we may so say,

self-sacrificing entity, since it submits to any absurdity or impossibility which we may choose to impose upon it. It has even submitted, without murmur or complaint that I have heard of, to be represented as having *four*, and in some cases as many as *six* or *seven* rectangular dimensions.

But space has no one of the ontological tests of real existence. It is not opaque, and, therefore, cannot be seen. It has no density, and, therefore, cannot be felt by any contact or pressure of the hand. It never acts as cause, and, therefore, cannot be proved to exist by any process of reasoning known to modern psychology or philosophy, or recognized by sensible men anywhere.

It has been said "space cannot be a substance, because it has no properties; it cannot be a property for it exists where there is no substance." This, I think, though it is rather witty than wise, is nevertheless a proof that space is neither a substance nor a property, and if not either it can be only a fiction.

Much the same may be said of time. We cannot discuss questions of history or speak of events occurring one after another in the natural sciences without supposing time as something that extends from the one to the other, something that began before they began, and outlasts their existence. Unlike space, however, it is not supposed to have extension in more than one direction or dimension. It *lasts;* but it has no extension — not even two dimensions.

And in the physical sciences we can hardly proceed a single step without these two fictions. Every object with which these sciences can be concerned exists "in space," and "occupies space," more or less of it — the space of those dimensions I mean — and every event or change occurs "in time" and "takes time," begins at some particular point in time, which point, etc., the exact distance of it from another assumed or well-known point, is often of the utmost importance to the exactness of the science and the truths with which it deals.

I might carry my illustrations into every branch of science and every department of human thought, and show how in order to express our thoughts to simplify and condense our statements we invent fictions and make them do for us laudable and lawful service.

Everywhere we have facts and realities, real facts, to begin with, and everywhere do we call to our aid or create for our use, legitimate or illegitimate fictions, such as fancy may suggest or necessity may require.

Herbert Spencer suggests that with these five, matter, motion, time, space and force, we can explain all the phenomena of the universe, the life and acts of men included without recognizing the reality of mind in man or the agency of God in the universe. But "time" and "space" are mere fictions, motion is an abstraction, and all we can have is matter *in motion*, or moving; and "force" is but a mode, or degree, rather, of the mode which we call motion. Since whatever moves at all moves *with force* — more or less of force — according to the velocity of its motion.

Hence, of the five elements of the universe, as Spencer undertakes to explain it by the one process of evolution; four are mere fictions and one only is a reality. And from the domain of reality he has left out mind as an active agent, and God without whom nothing that is could exist. Mind is made to be but a mode or phase of matter and God is the unknowable with no recognized relation to the universe.

I think I may now generalize my statement and say that whenever we use an abstract term — when the logic of language and the conditions and requirements of intelligibility require a concrete term — that is, whenever we use an abstract term as either nominative to an active verb or to denote the object of a transitive verb, then and there we create for the occasion, out of an objectified abstraction, a fiction, or rather, we create the fiction by the very process of objectifying the abstraction.

We gain by this means much — very much — in two ways.

1. Our language becomes figurative and poetic, brilliant and inspiring. It awakens attention; it excites imagination; it helps memory; and it enables us to say in a brief, explicit way what otherwise could be expressed only by many words and most cumbrous circumlocution, or possibly not at all.

2. But, again, this use of language often enables us to state the fundamental truths of science in their most comprehensive and abstract form so that we can consider and contemplate them without the exceptions, difficulties and embarrassments that almost always accompany their comprehension and application in the details and the exceptional cases that occur in practical experience. By this means we can have many of the truths and formulæ of science, which we can learn before we know any thing of the subject-matter to which they are to be applied.

3. And I think that this use of language and the mental processes out of which it grows does much for us also in a moral and religious way. It tends to idealize life; to give us confidence in the unseen; to familiarize the mind with the idea and the belief that there is something that is real, substantial and permanent besides the things of time and sense; something that may endure and be eternal when all things that we see and handle about us shall have passed away — passed into a possible nothingness from which there is no return, and when our own bodies shall have crumbled to the dust out of which they were made and our spirits have gone to God who gave them.

For most assuredly there are such realities — realities that no age can see and no hands can touch. All of the unseen is not mere fiction, as mere sensationalism and materialism — pardon my use of the fictions — I mean sensationalists and materialists — would have us believe; the mind is as real and as substantial as the body. God is more substantial — more of a substance, if the expression may be allowed — than the material universe. And yet, not only hand and eye fail to cognize it or Him, but the mind in that form of its activity,

which we call imagination, cannot realize, "visualize," either the mind that is and acts in us or the God who is in all — yet over all — forever.

4. And of course the use of fictions enters largely into all forms of poetic composition. In fact there can be no poetry without them. The truths of science and of nature although sometimes grand and sublime — sublimely grand — are, nevertheless, sober and prosaic. They appeal to insight, to understanding and to reason; seldom to imagination and fancy; although there is a use of imagination that is indispensable to the adequate conception of any external object, and is of great use in the prosecution of the scientific comprehension of all objects.

The poet in fact to a large extent creates a world of his own; and it departs widely from that world which God has created, and the objects within it that He has given us as the basis and material of our science.

But of course there is an illegitimate use of fictions in the pursuit of science, which is inconsistent with scientific accuracy and unfavorable to the true progress of science.

So long as the fictions are used *legitimately*, that is so long as everybody, both he that speaks or writes, and those to whom or for whom he speaks or writes, knows and acknowledges that they are but fictions used for the sake of convenience, and to subserve the cause of truth, no harm can come from their use, but much good in many ways, as I have suggested. But when they are used as facts or as if they were realities much harm ensues.

1. In the first place we recognize as facts to be taken into account, and accounted for in our scientific investigations and generalizations, what are not facts at all. If we regard the equator as a reality, a fact of *nature*, of geography and of geology, as truth and in the same sense as the river Amazon or the Andes, we have embarassed, and perhaps, hopelessly complicated, the problems we have to solve. If we take gravity as a substantial reality, a something between the earth and the moom, as real as either of them — a third thing to be taken into the computation and accounted for in our theories of the tides and other phenomena of the moon's motions and the earth's perturbations, the problem becomes a very different thing from what it is, if we regard that which we call "gravity" as only a convenient fiction, to be used indeed for popular purposes and for rhetorical effect, but to be entirely neglected in attempting to find the real causes of those phenomena. In this case we have a very different and a much more simple problem before us.

Or in another field. If the speculators in moral science from Plato to our day had regarded "*ideas*" as merely convenient fictions, and as nothing more, fictions that had no origin and have no nature any more than the equator or the parallels of latitude, how many hours and years of anxious study, how many volumes of "profound" speculation, how much of bitter controversy concerning this nature, its origin and relations, would have been saved to the world or the

world have been saved from the inflictions of this occurrence and demands upon its attention.

2. In the next place, the recognition of these fictions as facts is constantly suggesting events that never took place. We say "light comes from the sun." But is there any act of coming in the case? Is there any such event to be accounted for? The *sun heats the earth*; this is a simple truth, truthfully stated. But the assertion that the light "comes from the sun," or that the "sun *sends*" or "*emits*" the light is poetry or mythology, but it is not a *scientific* statement of the fact or the event. It both *assumes* a fact that does not exist, and it *asserts* an event or a phenomenon that does not take place. And it is acknowledged now, I believe, on all hands, that the first and most important of all things to be done in the pursuit of truth is to separate the facts from all theories about them, and from all fictions and hypotheses or assumptions that may have been mixed up with them. Take into account *all* of the facts, and *nothing but the facts*, is, I believe, the fundamental and the first maxim of the modern and most approved methods of science.

3. As a third evil that results from the mistaking of these fictions for facts, we may mention the very common reference to them as accounting for and explaining real events and observed phenomena. These fictions have of course no effective existence anywhere, and whenever, therefore, we refer any event or effect to them as an adequate cause or explanation, we are sure to rest in an error or misapprehension, or a delusion that cannot fail to be the parent and seminal principle of many other mis-apprehensions and errors. Just to the extent that we make this mistake we lose sight of the real causes of the phenomena of nature, and deprive ourselves of the means of reasoning from nature up to Nature's God.

But for all purposes except the one purpose of a scientific understanding and explanation of the precise fact or phenomena before us, this use of fictions does us no harm, but, as already said, it is a convenience if not indeed a necessity.

Take the case of heat. All the observed phenomena are *as if* it were a substance, and can be and is "sent forth," "emitted," "radiated," "observed," "reflected," "conducted," "converted," etc., and *as if* it were a real or efficient cause that "expands" bodies, "liquifies" solids, "volatilizes" liquids, "dissolves" chemical compounds, etc. For all purposes except this one, the *scientific* account of the nature of heat and of the phenomena we ascribe to it, this "as if" is as good as the fact; the result is the same in both cases, and the observed phenomena are better understood and described by the use of the fiction, the "*as if*," than without it. But when we come to the central fact of science and the ontological question, what *is* heat? we want the fact; and the "as if" is only an evasion, a confession of ignorance, or a snare and a delusion. Some speculator will take it for a substance — a real cause — and use it as Spencer has done. Time and Space, Force and Motion, are elements of a system of the Universe — a system of the universe in which

there shall be no recognition of God, no sense of duty, and no hope of immortality.

I have, in the earlier part of this paper, referred all ontological realities to the classes, matter, mind and God. I have then also referred to the objective distinction between them and also the difference between them that is based on our methods and means of cognition and of knowledge concerning them. And in all our reasonings and inquiries covering the phenomena that fall under our observation we tend toward, if, indeed, we do not always arrive at, precisely the same result. We never see any thing moving as if under the influence of "gravity," without looking for some mass of matter outside of and at a distance from it. We never see any thing changing as if by heat without believing that there is something else that is acting as a cause and actually heating the changing mass. We do, indeed, for the sake of brevity and convenience refer it to heat, but we never for a moment suppose that there is any heat, or any effects that can be ascribed to heat, without a substantial thing that is really producing the effects. We never think of a virtuous act without referring to some human being that performed the act. We do not believe in any "effective virtue" except as men and women exist and perform the virtuous acts. We nowhere find in the world around us any thing that implies a guiding and controlling influence upon the objects of mere nature without looking for and believing that there is or was either an animal with instinct or a *human* being, with intelligence, power of choice and *voluntary* action combined as an active cause in its production. And so, too, both in nature and in history, when we find an event which mere matter acting under the conditions and laws of inertia cannot have accomplished, and which neither man nor animal, by reason of their weakness and ignorance, could accomplish, or which by reason of their absence or non-existence, they could not have done, as in the earlier geological periods of our earth's existence, we recognize it as a miracle, ascribe it to God, and consider it a proof of His existence or active participation. When we are in sober, scientific earnest, we never stop with mere abstractions or fictions, but we push on, in our inquiries, until we come to some concrete, substantial reality, and that reality is always a material object, living or dead, or the mind acting within a body as that of man or woman, or to God, the creator and first cause of all things. Even if we adopt the theory of evolution, there must have been many periods in the past when the atoms of matter were either at "rest" and inactive in infinite diffusion or in "equilibrium" in a state of infinite condensation. Nobody supposes that these atoms could have thus *set themselves* in motion or action at these times; the "forces," so-called, were not and are never real causes, and God alone could have begun the new evolution.

So, too, at a later stage, when the four elements — oxygen, carbon, hydrogen and nitrogen — were first combined to form the extremely unstable compound "protoplasm," C_{36}, H_{26}, N_4, O_{10}, nobody

supposes that there was any violation of the known laws of chemical combination. And yet nobody can now produce that combination by mere chemistry, nor can he tell how it might be produced or why he cannot produce it. Tyndall may have "created," as he says he did, "the boundary of experimental evidence," and "seen," as he claims to have done, in the rapt vision of poesy or of prophesy, in the matter of that prezoic age, "the promise and the potency of all terrestrial life," "every form and quality of it." But what he did not see, or what he has not told, if he did, although just now it is the one thing which it most especially behooves him to tell us, is how those elements were to unite and form *living* beings, with growth and reproduction, decay and death, without the intervention of some supernatural agent. The life and the soul are no mere compounds of the organisms, and no sensible man would expect that any mere union or combination of the four elements could produce, by way of evolution or otherwise, mind, than he would expect to find, on a chemical analysis, iron, calcium or chlorine in a substance where no one of these elements had entered into the union when they were united.

And again in the origin of new species, as at least the beginning of the larger groups which we call *genera*, there are facts which no science has explained, without recognition of divine agency. And the most advanced scientific minds are settling down into the conviction that neither matter nor any of the forces of matter, nor yet the agency of man alone, is adequate to the explanation of what we know must have occurred many hundred of times since the first organization of living being on the earth.

And if the miracles related in the Old and New Testaments are true and veritable historic events, we have here again, also, the divine agency, for not only did the contemporaries who lived then and had the best possible means of knowing, as well as the *strongest*, though by no means the best of reasons for denying them, admit that a notable miracle had been wrought and they could not deny it, but they also admitted "that no man can do such works except God be with him." Thus in whatever way we turn the matter, from whatever point of view we regard it, or by whatever method we pursue the subject or test our conclusions, we reach the result that there are three great realities, matter, mind and God — the latter One and Only; the other two divided or divisible, into innumerable individual objects so that there are but three within the domain of knowledge, all else is but fictions subordinate and subsidiary to facts indeed, but utterly without substantial existence.

EVOLUTION IN THE LIGHT OF RECENT RESEARCHES.

By Professor CORNELIUS M. O'LEARY, of Manhattan College.

The doctrine of evolution, such as we now understand it, has stood before the gaze of men long enough to enable us to determine the exact value of its conclusions, the amount of truth they embody and the admixture of error which obscures them. From a mere attempt to solve a biographical problem, it has shot its branches into every department of science; it has sought to unravel difficulties which had puzzled the wisest of men in the past, and holds to our eye the alluring hope that the tangled skein of truth will at last run into parallel and separable strands at its bidding. Little did Malpighi, Bonnet and Waller dream, when they first adopted the term evolution in opposition to the epigenetic doctrine of Harvey, that they had struck the key-note of a conjecture which was to leave an indelible impression on the philosophy of the nineteenth century. And yet it is claimed to be the unifying generalization which marks the correlation of mental and physical phenomena, and supplies the light by which we can discern their common source and tendency. Not only is the progress of the individual from a homogeneous cell into the most complex condition of heterogeneity, the goal of its inquiries, but it aims at explaining the manifold steps by which society has emerged from its primitive conditions, and the devious changes through which statecraft and morality have developed into their present complex attitude. Thus, there is no problem affecting human life and human interests which has escaped the searching influence of this principle, so that it is always worth while not only to keep well in view its tendency and activity, but to note the counter influence which researches and discoveries in the various fields of human inquiry exert upon it, as modifying, confirming or diminishing its power. Passing over what evolution has accomplished at the hands of Spencer and Darwin, we will view it as a logical whole, viz., as having a necessary beginning, middle and end. English evolutionism exhibits a disposition to halt; it is, so to say, illogically conservative. This disposition is eminently characteristic of the English philosophic mind, for no English philosopher from Locke to John Stuart Mill has accepted the entire consequences of his principles. Once the road to radical and revolutionary doctrines had been reached, the signal to halt was given, and so English philosophy, to my mind, exhibits the curious spectacle of magnificent links, powerfully welded together, but sustaining nothing at the end, giving to the eye the promise of that hope which it breaks to the ear.

This is especially noticeable in the history of the various phases of the doctrine of evolution. If ever a principle implicitly contained within itself the necessary identity of organic life and inorganic existence, that was the underlying principle of evolution. The most simple cells consist of well-known chemical elements to which they

may be readily reduced. Wherein, therefore, do they differ from their component parts? The conservative evolutionists tell us, that they possess a potential vitality of which the elements are devoid. But why may not these elements be lifted up to the plane of that potential vitality which they enjoy in the cell? If we disallow the operation of every other force, except that which is expressed by the term "evolution," we cannot logically deny the possibility, nay even the entire probability of such a transition of inorganic elements into cells endowed with a vitality we call potential. Many German disciples of the English school, having overcome the hesitancy which marked the conclusions of their masters, have boldly avowed the logical necessity of admitting a continuous and unbroken evolution, from the simplest forms of inorganic matter into the highest and most complete phases of organic existence. Of course the position thus assumed by the German evolutionist materially increased his difficulties, but it, at least, filled him with the gratifying sense of consistency. This is the view of evolution, regarded in its totality, which is held by Czolbe, G. T. Fechner, Lotze and especially Lanze, who recognizes, indeed, how difficult it is to determine "where and how the transition is effected from the manifoldness of the collisions of the atoms to the unity of the sensation." Another German exponent of what may be called mechanical evolution, Radenhausen, has endeavored to account for the existence of the solar system and all the organic life found therein by a gradual unfolding of the implicit powers of chemical elements. Thus the German mind, true to its known characteristics, rushes to conclusions, heedless of accompanying consequences, not caring what interests may be marred or overborne on the way. The legitimate outcome of evolutionism is not by any means a new factor in the history of philosophy. It enters into the mystic Pantheism of the Hindoos, it is to be found in the number theory of Pythagoras. Its feebler echoes resound in the teachings of the Eleatics. It was virtually the system of Empedocles and Anaxagoras. Even Aristotle is claimed as an evolutionist by Ziller and Lange; though his theory of first matter and substantial form does not seem to share much in common with the views of Huxley and Spencer. It was Aristotle who supplied to Harvey the suggestion of his theory of epigenesis wherein he supports the theory of "equivocal generation." Though he has often been credited with the dictum "*omne vivum ex ovo*," he in reality held to the transition of non-living inorganic matter to the highest types of organized living substances.

It is not my object to present to the Convocation a summary of the steps by which the doctrine of evolution has reached its present *status*, but to show that its doctrinal congeners in the early history of philosophy, as well as its latest developments, of which recent German philosophy has been the mouthpiece, have not halted at the point where the doctrine of the transition of inorganic into organic existence becomes a logical necessity.

When Professor Tyndall rejected the doctrine on the ground that

all attempts at spontaneous generation had failed, he *failed* to realize that the whole theory of evolution was thereby imperiled. He has already by his writings and experiments contributed so much to the erection of the structure that he did not deem that danger could frown upon the edifice, and so he left it, after the fashion of the Islamite's coffin, suspended in the air. Evolution must rest incomplete, and that too at the most important point, till it accounts for the bond of union which allies organic to inorganic substances. Helmholtz and William Thomson felt this necessity and sought to account for it by means of a theory which few now accept. We, therefore, have here a *hiatus* which evolution cannot cross, a gap it has failed to fill up, and whatever facts which science reveals tending to widen the chasm between organic and inorganic matter must of necessity detract from the claims of evolution as a scientific doctrine. Early in the century, Schwann pointed out the impossibility of obtaining the usual product of the fermentative process under conditions wherein the living germ was excluded. And yet notwithstanding the cogency of the reasoning he employed, and the apparent completeness of his experiments, contemporary chemists, among them the illustrious Liebig, refused to accept his conclusions. Their spirit was opposed to the views of even those early German evolutionists such as Schopenhauer and Von Baer, and he experienced the sadness, often the portion of bold innovation, of beholding his laborious and truly scientific researches go down into the sea which has swallowed up the fruits of many and toilsome vigils. Hoffman, Schroder and Dusch repeated the experiments of Schwann under more favorable circumstances, and the results proved in each case identical. Thus it was established in a general way that no change from purely inorganic surroundings to any condition of organic existence could take place in the absence of germinal, or in other words of already organized materials. But the still more careful investigations of Pasteur were needed in order to complete the proof and in many ways to demonstrate at length the actual non-transition from inorganic existence to organic life. Pursuing the labors of Schwann and the successors of that investigator in the same field of inquiry, he speedily reached and thoroughly confirmed the same important conclusions. But pushing beyond the pale of their inquiries he put together what they took apart, and proved that each species of fermentation proceeds only in accordance with special rules governing special cases. With wonderful painstaking and closest observation he showed us that throughout the changing steps which characterize vinous fermentation none but a vinous result can be obtained; that provided effective measures be adopted for the exclusion of all other fermentative elements, no progressive metamorphosis can take place except that for which the elements seem *per se* to be adapted. So strict is this intransibility that no two germinal elements of the same genus but of different species can cross over from their natural mediums. This interesting fact foreshadows for us in the realms of microcosmic existence what naturalists like

Quatrefages hold to be the truth in the species and genera of zoölogy. Thus we find not only in the transition of inorganic into organic experimentally impossible, but that organic elements are so determined by their primitive constitution that they can develop into one form of organized being and are as incapable of passing over into other forms as though they were wholly inorganic. The most interesting experiments of Pasteur have been conducted with the view of establishing their essentially distinct character, between the various fermentescible elements, and their success has been attended with most important practical results.

The distinction which is made between fermentation, known as chemical, and those which possess a purely physiological character lends additional weight to the objection which is urged against the transition of inorganic into organic substances. For though the former begin with organized germs, they pass up into higher forms, only through the agency of chemical force, and it is thus we obtain, "diastase," "emulsine" and "pepsine." No strictly physiological process is discernible in this species of fermentation, and no matter how we may change the conditions, the results remain the same, showing that nature surrounds the processes taking place in the vast laboratory, with lines of limitation which cannot be passed, and which consequently stand in the way of an indefinitely progressive metamorphosis. On the other hand, in that species of fermentation, known as physiological, the chemical force remains inoperative, and throughout the gradual changes which occur in it a vital function alone can be observed. All attempts so far made to modify the normal process of vinous fermentation have not changed its essential character but merely reduced its intensity of action and exhibited it in a pathological condition. Thus a German brewer named Oskar Brefeld has succeeded in producing saccharomyces in brewer's wort without a trace of alcohol. The same statements hold good in regard to lactic and butyric fermentation, and the conclusion is again forced upon us that nature constantly conducts her processes within well-marked lines, and that as a matter of fact no such gradations take place by which one process may merge into another, as is claimed theoretically by the doctrine of evolution. I will now call your attention to another result of Pasteur's labors, which though never contemplated by that *savant* as calculated to exert any influence on any other line of thought, yet possesses a decided and interesting bearing on the doctrine of indefinite evolution. Up to his time two views were held regarding the nature of fermentation, which though extremely ingenious and sustained by a deal of speculative argument constantly failed to account for the facts. One view was that this change was effected by the gases of the air and particularly oxygen and consequently that every kind of fermentation was a chemical transformation. Impressed with the belief, Jules Guérin, a celebrated surgeon of Paris, in the hope of arresting the fermentative process of putrefaction, adopted every possible means for the exclusion of the air from contact with wounded surfaces. He even

devised a special apparatus by means of which the air was pumped away from the vicinity of the wound. But all to no effect. Putrefaction set in as actively as ever. Leconte and De Marquay even substituted other gases in the place of oxygen, especially carbonic acid gas, but the result remained as before. The other doctrine which fought for supremacy with the atmospheric one was that a spontaneous alteration occurring in organic fluids after their issue from the body made the change a consequence of the loss of vital power. The experiments made to arrest putrefactive change fared no better when conducted in the light which this view was supposed to throw upon the process. The mere empirical treatment of wounds by the various preparations of coal tar was found more efficacious than all the attempts which had been based upon scientific theories. This fact strongly impressed Mr. Lister, an eminent English surgeon, and though he could not at first account satisfactorily for the results of what was then known as the antiseptic treatment, enough was perceived and understood by him to convince him that a thoroughly scientific explanation lay behind the highly esteemed accumulation of facts with which hospital records teemed. And at last the investigations of Pasteur furnished the key to the difficulty. It was ascertained that putrefaction was only a species of fermentation agreeing in its main features with the other fermentative processes and differing from them only in the different characters of the micro-organism which gave it birth. The question then arose whence came the germs which gave rise to putrefactive fermentation. The blood itself was but the pabulum, the congenial nidus or the habitat wherein a suitable germ could take up its abode and thrive and multiply. The germ must, therefore, reside outside of the blood and as the atmospheric air in the majority of cases was the only medium with which it would come in contact it was thereby conjectured that if the air itself was not the fermentative agent it might contain, floating in its interstices, the germinating elements in question. A number of experiments were instituted with the view of determining the correctness of the surmise. The air was, in one case, heated to 700 Fahr. so that it could not possibly hold any germinating elements under the conditions of potential vitality. A highly fermentescible substance, one that under ordinary circumstances undergoes putrefactive change in six hours, was brought into contact with this degerminated air, and after an indefinite period of time no change was seen to have taken place. A double conclusion, both highly interesting, followed from this experiment. In the first place it gave the finishing stroke to the nearly exploded doctrine that the putrefactive change was due to the action of the gases of the air, and in the next place it followed the logical process of exclusion that the true germinating material was of an organic nature which was held suspended in the air, and perished by exposure to an unusually high temperature. Surgery, the humanest of arts, was the first to profit by this unexpected turn of affairs, and the very discovery which set back indefinitely the claims of radical evolution has made it indebted to it

for one of the most marvelous innovations in the most exact and progressive branches of modern medicine. The *schizomycetes*, supposed to be the special micro-organism which induces fermentation in putrefying wounds, not only floats in the ordinary atmospheric air, but clings to every material with which they come in contact. Had M. Jules Guérin been aware of this fact he would not have contented himself merely with excluding the air from wounded surfaces in order to prevent putrefaction, but would have shut off all substances in which the noxious germs could have found a congenial abode. To accomplish this became the problem to the solution of which Mr. Lister at once addressed himself. The treatment of wounds with the different preparations of coal oil and especially carbolic acid had long been tried with pronounced success, and its beneficial agency was deemed to be of a directly curative character. This supposition led to their use in more concentrated solutions when it was discovered that, so far from contributing to the healing of wounds, they proved to be highly irritating. This fact puzzled the advocates of carbolic acid and led even to its practical abandonment till it occurred to Mr. Lister that the possible beneficial influence exercised by carbolic acid was due to its toxic effects upon the schizomycetes with which it came in contact. This thought inspired the Listerian treatment of wounds, and each day's experience lends its testimony to the value of the discovery. Of course the antiseptic idea lay at the bottom of the principle, but it lay there in the dark, groping for the light. Men felt that the fermentation of putrefaction had to be arrested ere sloughing of wounds, pyæmia and the traumatic inflammation of internal organs could be prevented. The theory of evolution, however, stood in the way for its advocates asked "how could it come to pass that a biological process should be arrested since this would imply a halt in the onward course of beings constantly struggling to emerge from a lower to a higher grade in the scale of organized existence?" But the fetters had been partially broken, and the truth was soon fully established. The supposition that a progressive development from a lower order of beings must necessarily continue was finally abandoned and the triumph of Listerism was complete. These results of Pasteur's investigations possess a pregnancy of meaning that may not be appreciated at once, but their significance, so far as they are going to affect the future of the doctrine of evolution, will be better understood when their relations to that theory will be more clearly perceived. The French experimentalist never had in view any possible or probable consequences which his researches might exert upon any system, nor did this enter into the scope of his inquiries, but as a fact the result of his explorations will most surely make itself felt upon the future fortunes of evolutionism. They will especially tend to confirm the belief of many eminent naturalists that zoölogical species and genera are immutable and will check the disposition to theorize over and beyond what the actual facts justify. If each species of fermentation is rigorously confined within its own limits,

and has been proved under every conceivable variety of experiment as incapable of passing over into any other form, why may we not consider fair and rational the claim of such zoölogists as Quatrefages, who maintains that animal forms can undergo only definite and specific changes. But I can pursue my subject no further in view of the limited time at my disposal. I feel that I have but barely suggested the outlines of a theme which might spread itself indefinitely and gain clearness and weight by a more complete method of treatment. If I have succeeded in conveying a little of my meaning — I feel that a suggestion is all that is needed here for such a purpose — I am satisfied.

Professor W. D. WILSON — Mr. Chancellor: I would like to say a few words. I will not say many to occupy much time. I heartily appreciate the paper and agree entirely with the author's conclusions. I think he has adduced here some new facts in favor of it, and I think they are unanswerable. My object is to suggest a few things to those interested in the subject in a different light. I ask the gentlemen who claim to believe in evolution, this question: Are you willing to admit that evolution is a word that may be used to denote definite processes? If you hold evolution without God, who is its author and whose will is its limit and its law? I ask you this question. We know that in the past ages of this world there was a time when there was not an organic being in existence on this earth. We all admit in a general way there has been a progress from a lower to a higher order of beings, but we will not say up to the last — up to man. Is man the highest being that can be conceived? Why, if it is a progress, has it not gone further? If there was a God at the beginning, His will is the explanation. If not, I ask the question; if not, I ask the question with all reverence, why has not evolution produced one?

My object was to state a few facts and conclusions I have recently reached upon the subject bearing entirely upon a point germane to the question: The recent origin of man. If man is a mere evolution, then of course there must have been a great many thousand years in his past history, and yet after all it is very uncertain when our ancestors became men or became what modern geologists would call man. Give them that and the benefit of the whole. The greatest evolutionists will hold that there is no evidence of the existence of man before the close of the glacial period. Huxley says there is none worthy of consideration. Most people suppose that there was an infinite time in the past and it gives scope for this theory of evolution. This glacial period was but a few years ago elaborately discussed. It was claimed that it depended upon astronomical changes — differences of distance between the earth and the sun. It has been shown that these different distances had little or nothing to do with this glacial period. Three statements which I can offer will satisfy everybody. In the first place, the computation is purely a mathematical one. It has relation to time in the past and the

amount of heat we receive from the sun — I am speaking now of evolution generally— and the amount of heat which we would actually receive in the position we are said to have occupied would be less than it is now by more than three degrees, putting us where we were when the glacial period prevailed, and the temperature would not be cooler than the temperature in the north of New Hampshire, Vermont and in Canada.

The next point was suggested by Tyndall twenty-five years ago. He said to them, "when you are accounting for the glacial period, if you have cold enough to freeze this vapor, you omit one important point — where did this vapor come from? They could not have vapor without evaporation, and that evaporation has been computed. And take the last computation; I think it is pretty large, whether it was enough to reduce the surface of the ocean two hundred feet, or as one puts it two thousand. You must have had, while this ice was forming, heat enough to raise these millions of cubic yards of water into vapor.

The next fact is that we have now glacial periods. There is now a glacial period in Greenland as everybody knows; one in the Himalayas; one in the Andes, directly under the sun; immense gatherings of ice in the North American continents and the Asiatic continents. Let us break a canal across the isthmus of Panama and you will have a glacial period in England in a very few years. At any rate it will become utterly uninhabitable. Have we any means by which to determine the date of these glacial periods? I have taken pains to find these facts, and they are glorious facts of the majority of changes which have taken place since the close of the glacial period. The Niagara Falls for instance were at the close of that period down at Youngstown. Now, have we any data coming from the observation of man whereby we can compute the rate it receded? Many such computations have been made by different professors in geology. The shortest is six thousand years. The next is twelve thousand years. The average is about eight thousand years.

The most interesting statement I have in this respect is one recently published by Huxley himself. It has been claimed years ago that the inhabitants of Egypt have lived there a long time — that there were geological proofs extending back thirty thousand years. Professor Huxley speaks of having examined the question not long ago. The Nile valley is originally caused by soil brought down with the waters which fall upon the highlands at head waters of the river Nile in the mountains of Abysinnia, and which pass northward through that valley, and the many objects there excavated have been covered by the alluvium which has been deposited by this river. He says that after careful examination he finds there is nothing to prove that in the neighborhood of Memphis, where the early settlements were, there is any evidence to require the existence of man ten thousand years ago. I think, therefore, there is another point coming up. What were these early men? What do we know

about them? Huxley himself states there is no reason to date them as far back as they have been dated — that the first man we know any thing about was in all essential particulars equal to the man of modern times.

Herbert Spencer, in his work on sociology, I think, says evolution is supposed to be always a change for the better. With regard to man himself he says facts show beyond question that the lowest men that we find now are degenerations from the earlier ones. I suppose nobody claims that there is evidence in the fossil remains found in the surface of the earth that there ever was a specimen of quadrumana more nearly human than those that now exist, therefore the supposition that the first human beings originated from these quadrumana is just about as absurd as to say now that a human child was born with a paw. We cannot find any thing animal that is more nearly like man than the lowest savages are now, who are so far from us and yet so near. I quote the authority of those supposed to be most strenuous in the theory of evolution. It does not and cannot explain how this chasm was crossed.

Suppose for the instant we had something made up of four elements or sixty-four, but say four, oxygen, hydrogen and two others; suppose they come together and form that strange compound called protoplasm. Yet where is it that mind came from; after the compound became alive where did that come in? There are a great many theories about the formation of man. He is another of these facts or points which the theory fails to account for.

Dr. MARTIN — Mr. Chancellor: I have listened with great interest to the discussion to which our attention has been called. Is it right that we, the instructors of the people, should place ourselves as it were in opposition to so much of the science of our age? It seems to me we are putting ourselves in a false position for the want of careful discrimination with regard to the matter. I did not, in listening to his paper, discover whether it was his purpose to deny the doctrine of evolution generally, or whether it was his purpose to deny the doctrine of indefinite evolution. There is a great difference between these two points. I would be very much pleased to have that difference more distinctly marked. It is late now and I would simply express my views briefly by saying that substantially I am out and out an evolutionist. Think of our being able to take low and minute forms of organization and trace the gradual progress in the structure of these things in the history of our planet; to find this progress written down in the rocks, from almost unintelligible animal life up to the more active forms of later ages. I, therefore, believe in evolution. Now when we come to discuss the question whether or not evolution can bridge the gap between unorganic and organic life, we are dealing with one of the most remote points of it — a point we have no right to touch except in the way of inference. And the question whether man can have been evolved from the lower forms of animal life, and whether the highest forms of the world's activity can have been developed from the lowest

forms by any process whatever — these are extreme questions. There is yet the question of whether one species of beetle is derived from another, or one species of deer for instance derived from another. These are questions for us. We have some history of these animals. Why should we go to the remotest past and ask if that form was derived from this? Now, let us state the questions that are before us, so to speak; the questions that are within a practical scope, questions that we can find some evidence about. We can find, for instance, some evidence why one group of horses is derived from another, as geologists have traced them from the eohippus to the highly bred horse. Here are whole beds of rock having the remains of animals in them. Put these in order and you get a tolerable conception of the matter. Let us leave these extreme lines. We do not know enough about them. We do not know enough about ordinary familiar facts to enable us to tell what the relation is to those extreme facts. Then there is another point that I wish to emphasize for a few moments. We do not take cognizance, we fail to take cognizance of the scientific position of our own day. Mr. O'Leary, for instance, spoke repeatedly of certain chemical forces. Here we can go to a certain extent and no farther. We have also vital forces and physical forces. All forces are simply convertible into one another. Light and heat and electricity and the other forms of these forces are not separate forces. These are but forms of that which is the essence of them all. What is that? It is not the union of forces. It does not exist in a certain chemical; it does not exist in a certain electrical substance. These forces do not develop without the influence of the first great cause. Physical science is bringing us nearer to it every day. Put this force of nature, to which so much has been attributed, together and it will all turn out to be as Dr. Wilson has illustrated this afternoon; all turn out to be fiction. There is not any such thing as chemical forces. We find one force acting through all the beauties of nature and carrying out the great design in the development of one special form from another, through all the ages we give every honor to the great creator, and there is no reason we should place ourselves against the scientific tendency of our time and fight against the doctrine of evolution.

Dr. WILSON asked if geologists prove that one species came from another species.

Dr. MARTIN — I think we go a little out of our line when we tread too much on their ground.

Dr. WILSON — I wish to say I agree myself entirely with the theory of evolution that it is God working in nature; but an evolution without this working force is simply absurd. I want to ask him a question, however. He says geologists have proved certain things. I want to ask him if geologists have proved that one species came from another species.

SANITATION.

By Dr. D. F. LINCOLN, of Reading, Pa.

MR. CHAIRMAN, LADIES AND GENTLEMEN: I propose to go directly to the point and waste as little time as possible in introductory remarks. You are all interested in the subject of school hygiene. It is difficult to make your school-rooms healthful. I presume I am addressing an audience composed of a majority of actual teachers. My remarks shall be based upon that supposition and upon the supposition that you are willing to hear the subject thoroughly discussed. I begin by saying a few words in regard to ventilation. In visiting schools the first question I am asked is how to improve the ventilation of the school I am in. In the first place our breath contains a certain amount of carbonic acid. When you can get rid of the carbonic acid and supply its place with pure air you have reached practically a valuable — the desired result. To begin with there is about a normal quantity in the atmospheric air outside, the same in the street outside as we would find on the top of the Andes. There is very little difference between the air here and that coming in fresh from the country. Of course it is worse in the interior of crowded cities. In every one hundred thousand cubic feet of air which has been breathed there are four thousand cubic feet of carbonic acid. Now, there is a point beyond which we are not allowed to increase the carbonic acid, as we find it, for instance, in a close room crowded with people. There it increases from moment to moment. The more crowded the room is the greater amount of carbonic acid is generated. How much is allowed? We may add two parts to that already existing and make six parts. We may continue to use the air in a room until we reach that standard. Why is that standard adopted? It seems arbitrary enough. It is arbitrary, purely arbitrary. It depends upon the fact of certain discoveries in hygiene. It has been found upon going into houses the air in which contained more than six parts of carbon that a disagreeable or unpleasant sensation resulted. Now, by a simple arithmetical process we can discover how much ought to be in a certain number of cubic feet of space for one person — what space a person should have allowed to him in the closest room, so that at the end of an hour he should not have more carbonic acid than I have stated. A little arithmetic is all that is necessary. Knowing how much carbonic acid escapes from your lungs you find that that room or that amount of space makes about one hundred cubic meters or thirty-six hundred cubic feet.

(Uses the blackboard.)

A room, therefore, ten feet high, ten feet broad and thirty-six feet long contains enough air for one person to use in an hour. I expect that when you consider that statement you will find it exceeding large. It is intended, however, to be sufficient to cover all the demands that science makes. You will see that it is quite a

problem to get that amount of air into a room that is as full of people as this room here, for one person is perfectly comfortable in a room ten feet high, ten feet square and thirty-six feet long; then it is easy to find how much space is necessary for the number of persons here. This room should be magnified a great many times in order to give sufficient air. The change of air that ought to go on in a room like this is such that the whole contents of this room should pass out and disappear once in six or eight minutes. If you have a school-room relatively as full as this you ought to change the air in that school-room once in six or eight minutes to have good ventilation. A few more figures, a very few more, and I shall have done with that part of the subject. I will add now a datum in regard to the air the individual person ought to have supplied to him — pure air per second and per minute.

(Uses blackboard.)

That statement is easily remembered. For every individual one cubic foot per second, sixty per minute and 3,600 per hour, which I represent by that diagram. I will modify that statement. I will say that this is desirable for a house that is tenanted all day long, but as in school-houses you have five minutes' recess at the end of every two hours, when the contents of the room are renewed or freshened, or ought to be, you are not under such strict conditions, you do not need as thorough a coincidence with the requirements of science as in a dwelling-house. In a dwelling-house the people remain constantly ten or twelve hours with the windows very little open. In a school-house you have recess at the end of one or two hours, the scholars all leave the school-house, and after a time sufficient to ventilate the school-rooms they come back. You should have thirty cubic feet of pure air per minute and eighteen hundred feet per hour per scholar, and you will find that is enough for ventilation. I do not think it necessary to further illustrate this. It is something every school teacher and every one connected with the education of children should bear constantly in mind. This should no more escape you than the remembrance of the decimal value of an eagle or of a mill. You cannot forget what part of a dollar an eagle or a mill is, nor should you forget such a statement as this primary principle. With that in your mind, you can judge whether the ventilation is effective. It will be better for me to refer you to books of a technical nature on the subject than to try to impress any more figures upon you. I will say, in regard to schools I have visited, scarcely one in forty is sufficiently ventilated. There is something to be gained by showing you, while passing along, the rapidity with which air escapes from a room. This little instrument shows, by an arrangement acting by clock-work registers, the number of feet, lineal feet, that a current of air is traveling. If you take a walk with this with you, you will find when you have walked a mile it registers a mile, provided you have not walked against the wind. Hold it up out in the street here, and it will register, in an hour, the number of miles the air has moved. One of these instruments costs from $20

to $30. It has become a necessity for every scientific desk. If you take a silk handkerchief and hold it before the ventilator, you can judge whether or not it is drawing at the rate of one, two, three, four or six feet; whether it is drawing as fast as it ought to, or nearly as fast. I hardly need speak, I think, of the evil effects of bad ventilation. It takes from us the power to use our minds; it indisposes us for an hour or two after leaving the badly ventilated room; not even the nervous strain of application to a great variety of subjects injures the pupils so much as bad ventilation. I will say that it is very common to have three times as much foul air in the room as is desirable; it is very common to have ten times as much foul air in the room as science allows. This can be detected by the sense of smell. You may be interested, perhaps, to see the test showing the amount of carbonic acid there is in pure atmosphere. I have here two bottles of the same size — they are ten ounce bottles — one has been filled with street air which is to-day, in Albany, pretty pure air; I pour into it one-half ounce of lime water and watch the result; I will say, by the way, this lime water has been kept closely corked for some months. It seems not to have deteriorated in the least, because it has never been allowed any contact with the air. I think this experiment will show no change — will give no perceptible discoloration. The test requires shaking of the bottle ten to fifty or one hundred times to absorb any carbonic acid that may be in the atmosphere.

There are many ways for the ventilation of a room — many are good, many are bad. One bad way is by a cold flue. A bad chimney is one that is kept cold. Go back to the school rooms, built forty or fifty years ago and provided with the then best systems, you will find the flues to be so placed as to be chilled immediately by the air outside; they are placed within four inches, perhaps, of the air outside, of a temperature perhaps below zero; there is but one brick between them and the outer air. If you wish to ventilate your school-house properly adopt the flues adopted in the city of Troy. The gentleman who should have the credit of introducing them, with whom it is an original idea, is Mr. Beattie, superintendent of the public schools of Troy. His system consists in placing flues so as to interfere as little as possible with the occupants of the room. These flues are about six inches across, so that their cross-section is about a square foot. Let them go up straight — have no bends in them, and let them go up so they will not become chilled even if they have to be carried through the school entirely; then they can be boxed in wood. Let them go straight through the roof to a point sufficiently high to insure the foul air being carried off. By that simple method Mr. Beattie has succeeded in improving greatly the ventilation of the public schools in the city of Troy, and I can assure you they needed it. That system has been modified greatly by the Gould system which many of you have seen frequently in advertising circulars. In that system the ventilation

depends upon the heat of the flue which is placed inside of a larger flue. The principle is adopted to give you a larger suction. In purchasing these ventilators there is a royalty to be paid to the patentee, and I think the royalty will be well paid.

(Taking up bottle.)

This has been held in my hand and shaken up considerably. You can see no considerable discoloration. It professes to be pure air. I will hold it a little longer until you are satisfied it is sufficiently shaken. I will now take some air from this room, not expecting to find it impure because the windows are open, but to give you some slight comparison. You will be often asked if a fire-place is not a good place to ventilate by. I wish every school-room had a fire-place in one or two corners of it. That fire-place will draw probably in summer and winter, but it does not draw enough to ventilate the whole room. Perhaps the average fire-place will ventilate for ten persons, not more; therefore, do not put too much reliance upon the fire-place. Exert your influence to have a fire-place put in the new school-house, however, for it works well in summer, when you do not like to have the windows open. It may be a day during the summer when the thermometer is down to forty or fifty and you do not care to expose the scholars. There are means to heat this fire-place. Use kerosene lamps or gas burners to assist ventilation upon these days. The best system of ventilation, however, consists of a brick flue heated. How shall we heat the flue? In the first place the smoke goes from the furnace by a twelve-inch or at least a ten-inch cast-iron flue up through this brick work. It should not be Russia, but cast-iron, to prevent the escape of the gas which is likely to occur. In addition to this conduit place the flue for supplying pure air as close to this as you can. Let me draw a section to illustrate what I mean. (Blackboard.) Let this illustrate a space in the corner of the room. That represents the smoke-flue. I place it in the middle of this apartment for taking out the exhausted or vitiated air. It imparts all its heat to the apartment, and thus supplies fresh warm air. The air comes up here, enters the room here, and is taken out from the room —an aperture not represented—and carried away. You will see that a certain amount of heat from the air that enters the room is wasted —is expected to be wasted. We know that a hot-air furnace is not a very economical apparatus. It is uneconomic, because some of the heat is wasted—lost in passing up to the room. Let us save that amount of heat if we can. We do so by placing it close to the conduit for foul air and it is utilized in causing an ascending draft of foul air. The principle has been adopted in the city of New York. And in a school lately constructed under the sanction or at least under the advice of the State Board of Health, in a school in the city of Baltimore. Two schools have been constructed upon the same principle of ventilation; they are practically one so far as ventilation is concerned. One or two other points ought to be spoken of. Teachers leave the normal schools year

by year and pass directly to schools containing from twenty to forty or sixty pupils in one room; a great deal can be said to them about simple methods of ventilation by the windows. In the first place place a board in such a way that the air shall not strike directly upon the heads and shoulders of the pupils. Let this represent the sash of the window; raise the sash three or four inches, and in front of the sash place the board so as to shut off the direct incoming air. This piece of white paper represents the board in this way; the air now enters from where I am — I am supposed to be out of doors — and it will strike the board and rise so high before it begins to descend. Make the experiment and satisfy yourselves. Make the board wider or narrower according to your ideas. Open the windows at the top if you think you can safely do it. What is the effect? Place the board slanting in that direction, you need nothing at the top aperture. Never mind your patent constructions. These are the best things to begin with. There is no patent for placing a board in front of an open window. You do not require dust sifters. If you want one make one yourself. But remember if you sift the dust you impede the incoming air. I could easily exhaust my time and yours in speaking of this one point of ventilation because of its extreme importance. I will mention, ladies and gentlemen, the list of topics I will suggest for your further consideration. One is the proper position of the windows in relation to the use of the eyes of the pupils; they should not be in front of you, but on your left side. Another is the sewerage, the sanitation, the purifying of the grounds. That is a point I most earnestly desire you will take up — that it will be taken up by the normal schools and spoken of and carried on to its end. I know normal schools are not well instructed in that respect, and I think it is one of the first things that ought to be taught to the graduates of normal schools. It does not receive sufficient attention; I find the lady principals of small schools neglect it; from motives of mistaken refinement on their part they throw it aside. They think it is unladylike. I think every normal school pupil, male and female, ought to understand and take hold of these matters. I think that is a good reason for enforcing the study of hygiene in the normal schools. Physiology ought to be studied in a great many things scholars must know about their own bodies, but ten times more ought the pupils to understand sanitation. There are books you can give pupils and say to them, commit five pages for to-morrow's lesson. A teacher ought to know ten times as much as a pupil before he begins to teach, he ought to know all about hygiene. I will mention one more topic. I find there was considerable debate upon the question of recess, whether pupils should have a recess of fifteen or twenty minutes in the middle of the session. The point in favor of recess is that it relieves the mind; the point made against recess is that it interrupts the discipline and brings the scholars into the school-room hot and excited. Some say five minutes is best; after a short recess the pupils can come back

and go to work properly. On the other hand, I have seen statements that it brings them in condition ready to take cold, and thus makes the scholars suffer. I suggest that as a topic for discussion.

Superintendent TOMPKINS of Elmira — Mr. Chairman, Ladies and Gentlemen — It hardly seems necessary for me to enlarge upon this subject, particularly the technical part of it. Perhaps I might say a little in the way of my experience in this matter when I first became connected more directly with educational matters as member of our Board of Education. Our city fathers, in their generosity had provided us with a good school building, perhaps better than the average you will find throughout the State. There had been at times attempts at ventilation, which led to my examining the matter. We had had enough of experience of pupils now and then dropping out of school to recuperate, which showed there were some defects somewhere in this particular; not but what delicate, nervous pupils who will apply themselves will overstudy and become weakened and find it necessary to recuperate their forces from this cause, but there were other cases; there were cases of extreme lassitude in the school-room in which not only the pupils suffered, but I think the teachers suffered more in reputation. Because many a teacher where she has pupils who have not pure air to breathe is blamed for the results; for every teacher knows that this is a cause of disorder and confusion and if she does not succeed in her work the criticism falls upon her inevitably. And hence, as I shall reach this question afterward, the necessity of teachers becoming thoroughly familiar with this subject in regard to window ventilation in the school building. I remember one of the assistants in our school found it necessary in the winter time during recess to ventilate our school-room by opening the upper windows. The thermometer ran down to 60 or 65 degrees. Now, if pupils after recess should come in overheated and sit down in a room like that the result would be that they would take cold. This is not a good way either as a matter of economy. The janitor would be called upon to increase the fire, an excessive amount of fuel would be consumed and as a further result the air become overheated and vitiated to a certain extent. This was where the rooms were warmed with a furnace. The system of ventilation adopted in that building is in a measure the same as that adopted in other school buildings, by placing flues reaching into the attic, connecting with Morrison ventilators there. The opening at the ceiling allowed so large an escape of air we found it advisable to close the drafts and only those at the floor were left open. The result was that on cold days in the winter the cold air had its effect in these flues. The circulation of air depends upon different degrees of heat and cold. We heated the attic — the roof was covered with slate — and it was colder still, and it was impossible to get the air in circulation. During my investigation I had occasion to go into the attic in summer when it was very warm. I examined the ventilators and found they were working very

nicely; there was a nice current of air going out through these ventilators. There was no school and the windows were closed. Of course, during the time of school, when the windows were open, the air was nearly the same temperature, they would have no occasion to work. At my suggestion the board of education adopted a system of ventilation that had before been tried. It is not original. I found it succeeded well. We placed it in the building. It is simply a small room in the attic ten feet square, and fire-proof, connected by flues with the various rooms on the first and second floors, and putting from it on the roof one of the Morrison ventilators. We put a stove into this room. This method is familiar to many or all of you. We have kept this stove going since it was started, and it was not put out until the day we dismissed school with the thermometer up to eighty. We have saved at least twenty tons of coal in the matter of fuel. That I speak of incidentally. The result of this saving, and of this method of ventilation, was that we secured a continuous ventilation of pure air from out of doors. Things were not as previously, when sometimes the wind was driving against the side of the building, and perhaps would raise a little pressure in the room, and stop the flow of air entirely. That is not an uncommon experience. If you take a close room, shut the doors up tight, you can get no action in your furnace. On the contrary, while ventilators would produce a vacuum in the room, the consequence is we get a fine, steady flow of air from the furnaces, which certainly gives us better air than we could get where it was perhaps overheated. I tested a furnace during the winter, in the extreme cold weather, when obliged to drive it highly. I took down a thermometer, and held it over the register, and I very soon had no thermometer. I procured another, and found the air from the furnaces registered 240 degrees, which I think is too high for a healthy atmosphere, but this was an extreme case.

Superintendent SNOW of Auburn — I am very glad that I am limited to five minutes, because I think I can hardly occupy more time than that upon the subject of sanitation. I am not an expert in school sanitation. All I know is the little I have learned from observation and experience in connection with the high school in the city of Auburn. Some time ago we attempted to heat and ventilate that building by modern improved system of ventilation. We put in some heating apparatus, and endeavored to ventilate the room by indirect radiation. We thought we had succeeded by putting ventilating flues in the inside walls and a steam boiler in the basement, and we thought we had something with which we could get along very nicely. It seemed as if the air in the room was being changed as rapidly as the most sanguine could hope for. The instructions were under no circumstances to open the windows, but to rely upon these ventilating flues. It reminded me of an experiment performed by my old professor in natural philosophy, when he took a rat and put it under a bell, and exhausted the air. The rat soon began to show signs of approaching dissolution, and that was about the effect in

the school-room. The air was either all taken out, and none came in, or however it was, it certainly was not a success. We had to resort, under that system of ventilation, to the windows, in order to resuscitate the children in the school-room. Last year, with the advice of several proficients in school ventilation, architecture, etc., we built a new school building upon the most approved plan, and I think it is about as perfect, theoretically, as you can get a school building. Perhaps you will be interested, if I give you a short description of the plan of the building. It is a building of four rooms, and two stories high. Each school-room is about twenty-four by thirty-five feet, with the light coming in upon the left side. In the center of the building is a stack or smoke-flue running from the cellar to the roof, with four flues for ventilation, one for each room entirely separate, each room being entirely separate and independent of the other rooms. The heat comes into the rooms about eight feet from the floor. The ventilating flue is at the bottom. The ventilating flues are two feet square. The theory is that the heat will come from this heating flue, go across the room and come back down over and out of the ventilating flue. When the architect became convinced that it would not heat the room, he put eight coils of pipe around the room for direct radiation, and attempted in that way to aid in heating the room. I may say to you that in all particulars, except heating and ventilation, our school building is a perfect success. We have only tried it since the first of March last, and have not had time to test it thoroughly. My impression is, from observations thus far made, we have made a mistake in the method of heating. We shall not succeed in heating it sufficiently. I am not prepared to condemn it until we have tried it more fully, and perhaps at some future meeting of this body I may be able to give you a full account of the results of our system of ventilation.

Dr. HARRIS, of the New York State Board of Health — I have prepared a note which can be read. I will speak but two minutes simply upon the question: How can the health of school-rooms and the hygiene of pupils in our higher schools, as well as in our country schools, be best promoted? The gist is in this idea which, I think, is concurred in by you all, that a knowledge of physical science, upon which success depends in the protection of life and health, should be studied more carefully, or should be sought after more carefully by all classes of teachers; and that, in order to secure in the State of New York the best and the most specific results, we would advise that the normal schools, as we find them, should be the seats of supply, and endeavor to secure correct illustrations of all that relates to perfect school hygiene in all things that could be classed under such a head. In order to attain these results we have only to furnish data, illustrations and every thing pertaining to the subject and educate the pupils — give them the results of our experiences. My friend, Professor Waterbury, has succeeded in conquering the entire Legislature, carrying his propo-

sition without any difficulty. We find here in Albany by the same showing the first normal school building in this State, and the State has nobly endowed the trustees of that school with adequate funds to build a suitable sanitary school building. I have seen all the normal school buildings of this State, and most of the teachers, and I must say I see no reason why they cannot proceed at once to impart that knowledge in physical science as applied to the protection of health and life, and I think it should be first illustrated in the normal schools. I understand the failure in Auburn. They wanted to carry it out at a very small expense. It is a mere matter of good air and proper temperature, which is, perhaps, difficult to secure in that very cold town. In all the work of the teachers of the normal schools there is one lack chargeable to the medical profession, or to sanitary officials, and that lack I believe can be supplied, namely, the proper teaching of hygiene and the practical and suggestive methods by every means that science and experience may now offer in the schools and colleges. In the universities there is no practical difficulty in getting proper instruction where the endowments are adequate, and when not adequate the public generosity of our fellow-citizens is safe to apply to. Therefore, I look forward to the work now in progress, which has been initiated by the same great directors, now organized in the efforts made by the State Board of Health to make this a systematic endeavor that the normal schools of this State shall adopt the principles of sanitation and hygiene of the scholars in the school-room.

SOME OPEN QUESTIONS ABOUT NORMAL SCHOOLS —A MERE OUTLINE.

By T. J. MORGAN, Principal of State Normal School, Potsdam, N. Y.

PRELIMINARY.

Let it be premised as settled, that —

1. Training schools are an essential part of our public system of education.

a. Teaching is a profession.

b. There is a science of pedagogics.

c. A few months of observation and practice under intelligent criticism in the training school may supply the wisdom gained otherwise only by years of painful experience.

d. The normal school sustains to the profession of teaching the same relation that military, theological, medical and law schools do to the professions of law, medicine, theology and arms.

e. A wise economy in the yearly expenditure of more than ten million dollars by the State in the maintenance of its school system dictates the expenditure of a few thousand dollars in maintaining training schools to render the common school system efficient.

f. What has been urged theoretically has been verified historically and practically.

2. The normal schools of the State are to continue for the present undisturbed in their essential features.

3. Any radical and sudden change in the plan or management of these schools would be unwise.

a. These institutions, like the system in which they root themselves, are a growth, and by a process of evolution, extending through a series of years, must adjust themselves to their work and environment.

b. There is as yet no consensus of opinion either as to the defects of these schools nor as to the changes that are desirable to be introduced.

4. The open questions to which I now allude might perhaps better be called some practical problems, which in the limited experience of two years I have encountered in trying to perform most efficiently my duties as principal of one of the schools; I come not to advocate a theory but to seek counsel.

PROBLEMS STATED.

First. Is it possible or desirable that the eight normal schools of the State should be uniform in their organization, course of study, management, salaries paid, etc.?

1. In favor of such uniformity it may be said —

a. They are constituent parts of the same general system, under the same control, having in view the same general purpose, and have substantially the same class of material to work upon.

b. Whatever excellence in theory or of success in practice may obtain in one may, by mutual interchange of thought and experience, become the common property of all, and the accumulated wisdom of all become the possession of each.

c. This community of life tends to prevent any undue rivalry between the schools.

d. Vagaries of theory on the part of any principal, or faculty, or local board, as well as any unhealthy local influences are held in check by reference to the common standard.

2. On the other hand it should be said —

a. That the highest efficiency, in school life as in individual life, can result only from the greatest freedom. Conservatism tends to formalism and stagnation. Life and growth imply change; change is the condition of progress. The greater the number of schools to be affected, the more difficult is it to introduce any reform.

b. This is confessedly a transition period in the history of normal schools. They must be leaders in the educational movement of the day or they will be left behind. Leadership pertains rather to the few than to the many.

c. As a matter of fact each of those schools has its now strongly marked individuality. Albany is unlike Oswego and Brockport unlike either.

d. Some of the schools, Potsdam, for example, are constrained by their history and the plighted faith of the State, to maintain an academic department, while Oswego is impelled by its traditions and surroundings more and more toward a purely professional work.

Second. What is the distinctive aim of these schools? Is it specially to prepare students for the common or country district schools?

1. For this it may be urged:

a. These schools far outnumber all others.

b. They lie at the basis of the public school system; are preeminently State schools.

c. A very large proportion of the rising generation receive their only instruction here.

d. Those who go from the district to the higher schools carry with them ineradicable habits and ineffaceable impressions generated by their first teachers.

e. The character of the work done in the country schools is, for the most part, lamentably poor. Nowhere else is the quickening, elevating influence of the normal school more imperatively needed.

f. The idea which obtains in the country districts as to what constitutes a good school and of the paramount importance of maintaining it is so defective and the hindrances so great that, unless some powerful agency or agencies operating from without are brought to bear upon them, there will not only be little or no progress, but in very many cases there will be sure and rapid retrogression.

2. In opposition to this reasoning note

a. It is manifestly impossible that eight normal schools, if indeed

any number, can send out enough graduates to supply thirty-one thousand teachers for our public schools.

b. The country schools offer no opportunities for a professional career such as is demanded by young men and women of our day who have capacity and a professional training. There is no continuous employment, the school year of twenty-eight weeks being divided into two terms, one a winter term — to be taught by a male teacher — and the other a summer term — to be taught by a female. The wages paid are wholly inadequate. The school houses, for the most part, are, to say the least, unattractive and uncomfortable if not positively unhealthy and repulsive. There is an almost total lack of blackboards, globes, maps, reference books and other educational helps, which are as indispensable to the educated teacher as tools are to the mechanic, or chart and compass to the mariner. The schools are ungraded and in many cases incapable of being graded. There exists in many parts of the country such a prejudice against any change in the traditional organization, managements and instruction that a teacher who should introduce "normal methods" would be at once sharply criticised if not promptly dismissed.

While this state of things exists it is simply impossible to supply the country schools with normal graduates for teachers. Even the novices from the normal schools who are willing or are forced to begin their work of teaching in the country schools are utterly unwilling to remain there, and after acquiring some experience and skill seek employment in the graded village and city schools, failing to obtain which they abandon teaching for some more lucrative and attractive calling.

Whatever progress in theory and practice obtains among country school teachers will be due to the indirect influence of normal schools, exerted in very many ways, especially through the hundreds and thousands even of their undergraduates, who teach in the country schools, to procure means to enable them to prosecute their studies; to the instruction given in teachers' classes in academies; to the work of teachers' institutes and to teachers' associations, and to the gradual spread among them of pedagogical literature, books, educational journals, etc.

Third. Shall they aim to prepare teachers for the highest grades of work?

1. While admitting that a course of pedagogical instruction would be of the highest value to those who look forward to a professional career as teachers in universities, colleges and the various schools of theology, law and medicine, and would be in the greatest degree serviceable in introducing into those institutions improved methods of instruction, it would be chimerical to expect, in the present condition of things, to accomplish or attempt any thing in this direction through our normal schools. This could only be done by making pedagogy one of the departments in the university course. There should be such a department at Johns-Hopkins University, for example.

2. Shall they attempt to prepare teachers for the academies and union schools?

(1.) In favor of this note —

a. These institutions are under State control.

b. They exert a direct, positive and powerful influence upon all the lower grades of State schools.

c. In at least two hundred and fifty of them teachers' classes are organized from which thousands go out to teach.

d. The character of work done in these schools has not been largely affected by normal schools.

e. It would be practicable, by organizing normal schools with reference to that end, and by making a normal diploma a condition of employment in any of these schools after a period of say ten years, to provide a corps of highly educated, accomplished teachers for these institutions, and thus in a few years to raise the standard of efficiency in the entire body of teachers in the State.

(2.) On the other hand —

a. The lack of unity in the supervision of normal schools and academies is at the present time a practicable and formidable difficulty in the way of any scheme of this kind.

b. If the normal schools aimed specifically to fit students to teach in academies and high schools, it would be found that the competition for these places is very sharp. College graduates enter the list with the great advantage of superior scholarship, while the graduates of high school and academy have the advantage of local pressure in their behalf on the plea of employing "home talent." This is reinforced by political, family and personal influence.

Fourth. Shall the normal schools continue to follow the present course? viz.:

1. A very large number of our undergraduates teach in the district schools. I cannot speak with exactness, but my impression is that during the last two years we at Potsdam have sent out each year from one hundred to one hundred and fifty undergraduates each year to teach country schools. I found on inquiry last term that forty-eight students then in attendance had taught an aggregate of one thousand seven hundred and ninety-six weeks. They had, to be sure, enjoyed little or no distinctively professional instruction, but incidentally, by the character of instruction they had received in the branches they had pursued, by their connection with a large, well-ordered school, by association with normal graduates, and others still engaged in professional study, by the public essays, discussions and talks on pedagogical subjects which form a prominent and valuable feature of the school, by the pedagogic literature to which they have access, by observing work done in the training school, they go to their work in the country school with a very considerable amount of valuable preparation.

2. A goodly number of the graduates find employment in the graded schools, and now and then one is called to the headship of an academy, or to instruct the teachers' class, and some become school commissioners.

3. It is not uncommon for those who have graduated from the normal school to then take a full course in college and so become fit for high positions as teachers.

4. The faculties of our normal schools were of those in other States; position of training teachers in city schools are recruited from the ranks of normal graduates.

5. Something has already been done to train Kindergartners.

It may be confidently affirmed that the value to the State of this somewhat ill-defined and miscellaneous work done by her normal schools is worth all it costs and exerts directly and indirectly an influence for good upon the whole educational system. The intrinsic value of the work is not one of the open questions. Nor, perhaps, is the policy hitherto pursued open to the criticism of unwisdom. The question which does call for grave deliberation is whether the policy shall continue, or whether the time has not come for a new departure, and if so, in what direction? I may venture the opinion that the matter is worthy of the best thought of this dignified and worthy body.

Fifth. What should be taught in the normal schools. The answer to this will depend somewhat upon the answer given to the other two questions and somewhat upon the preconceived notion of what constitutes normal training *per se.* If in answer to the first question it be said the schools must be uniform then the course of study should be identical, but if there are to be grades in the character and work of the schools, the studies pursued must be largely determined by the environment of the school. If in answer to the second question it be said that the work of the school is to train teachers for the country schools, this will necessitate a curriculum widely different from that which would be demanded if the schools are to train teachers for graded schools and academies. Those who regard the schools as now performing their rightful function are divided in their views as to the course of instruction which should be followed.

I. One class affirm that as the work of normal schools is preeminently practical, namely, to prepare their pupils to teach certain well-defined branches, prominent among which are reading, writing, arithmetic, geography and grammar, their work should be equally practical and should consist chiefly in giving instruction, mostly by way of review, in these same branches. Whatever instruction is given in the science of pedagogy is given *en passant.* The theory underlying this answer is that the best preparation for teaching is to be well taught. He that would become a good teacher has only to imitate a good master.

1. It may be said for this reply

a. That it greatly simplifies the problem.

b. That there is truth at its basis and that the practical results of such a plan are admirable. This is the old way that antedates normal schools and has been justified in good works.

2. But, on the contrary, this abandons the idea of normal schools, by giving up their distinctive professional character. They cease to be normal schools and become academies or seminaries of learning.

II. Another answer that sweeps to the opposite extreme is that the course of study in the normal schools should be strictly professional. The student should be required to be thoroughly versed in all those branches which he proposes to teach. The normal faculty, instead of teaching arithmetic, grammar and other academic branches, should give instruction in such subjects as: The true idea of education; the departments of education; the laws of mental growth as conditioning the processes of education; the educational value of various branches of knowledge; the best methods of presenting each subject as conditioned by the logical sequence of its articulated parts on the one hand and the psychological state of the learner on the other; the true order of studies; a history of education, involving an account of the origin and development of educational theories; biographies of eminent educators; school organization and management; school supervision; educational helps and appliances; school architecture; pedagogical bibliography; etc., etc.

1. In behalf of this it may be said

a. It is strictly professional.

b It differentiates the normal from all other schools and gives them a distinctive work.

c. This work, if well performed by experts for students capable of receiving it, would impart to them a professional spirit and give them a philosophico-historic basis for their art. Teaching would become a science and the schoolmaster both a philosopher and an artist.

d. One such school properly located, well organized, ably manned, suitably equipped, rightly adjusted, would put our normal school system in the forefront and would at once become a leader in educational affairs for the United States.

e. The times are ripe for such an advance.

2. On the other hand

a. There is wanting the man. Such a movement means innovation, reconstruction, opposition. It requires a leader, a man capable, experienced, zealous, self-sacrificing, fearless and commanding public confidence. He is wanting. And for this lack of a leader the vast interests of education in this magnificent Commonwealth must suffer. We must wait.

III. A third answer is found in the curriculum of study substantially followed in six at least of our State normal schools.

1. The elementary English course of two years embraces reading, grammar, rhetoric, geography, civil government, arithmetic, elementary algebra, botany, physiology, zoology, music and drawing.

2. The advanced English course of three years adds to the above, elocution, English literature, history, advanced algebra, geometry, physics, chemistry, astronomy and geology.

3. The classical course of four years adds to the last, three years' study of Latin and two of either Greek, German or French.

In each of these courses one year is occupied by professional study and practice in teaching.

It should be noted that there is a marked tendency in two directions, first, toward raising the standard of admission, and second, toward an increase of strictly professional work.

There are other questions pertaining to normal schools, which are not fully settled, but which the limits of this paper will not permit me to state.

I think I can say for my associates in this work we seek truth, light, counsel, sympathy, advice, help, from any and all sources.

Principal HILL, of Havana — Mr. Chairman — It is admitted that the question is settled that there should be normal schools; that teaching is something conscientious and that there should be professional training in it as there is in medicine and theology. One of the open questions, as it seems to me, is whether these professional schools ought to be sustained by the State, and this involves us in the more general problem already discussed — of the State province in the direction of education. If, as the paper intimates, the principals of normal schools have to train teachers for the high schools and academies, I most emphatically object to their being sustained by the State, because I think that the State has no right to prepare teachers for such instruction, as it imports annually into the ranks of the teaching profession many persons who would otherwise have gone in another direction. This should be done only when the natural laws of supply and demand will not fill these places, and it seems to me a settled question that so far as the high schools and academies are concerned, they can be provided with permanent teachers under the law of supply and demand. I would like to illustrate that. Two teachers apply for a position in a high school. One has been educated in a State normal school; the other has been educated at his own expense at college. One who has been educated by the State is working for the same salary that is received by his neighbor who has paid for his own education. It seems to me entirely unjust, and I know many instances of that kind, and even of a teacher receiving smaller pay when educated at his own expense than another teacher receives who has been educated by the State. The question is whether or not the law of supply and demand cannot fill these places without the interposition of the State. Another open question is, it seems to me, how the normal schools are going to supply teachers for the country schools. It seems to me the legitimate province of normal schools, if province they have, is to provide teachers for the country schools. But if they seek only to provide teachers for high schools and academies, how can they attend to the wants of the country schools; the consequence is that the district schools are being neglected. I have learned many things since I left home. One is that it is the province of the State and Nation to educate its citizens not in the elements but in secondary or college education; that the great university is to be a university established by the State. The latter doctrine I do not admit, gentlemen, and stand strenuously opposed to it, and therefore I stand here to resist this tendency of putting all education into the hands

of the State. No more vital question occupies the public mind than this. I cannot admit that the State has the right to do any thing in the way of taking hold of the educational system as a whole; it has the right to the elementary work and to see to it that the schools, the district schools, are provided with competent teachers. Let the State assume entire control of these schools and educate teachers and train teachers for these schools and pay them. Perhaps then we shall have our common school filled with competent teachers. It has built a superstructure but has done nothing at all for its accommodation.

President WATERBURY, of Albany — A question has been raised, what the normal schools do for the common schools of the State. I can answer that from twenty-eight years of experience with the normal school at Albany with which I am pretty fully acquainted. The normal school at Albany in the last thirty-eight years has graduated more than 2,600 students and has furnished for the common schools of the State more than 8,000 undergraduates. I think that answers something of what work has been done for the State. The course of instruction in this school is two years or four terms, and of the persons who apply for admission, I give as an illustration what happened last fall. Two hundred and two applied for admission. Of these, 182 were examined; of these, 180 were admitted; of these, 146 passed an examination into the next class at the close of the first term. Now the fact is that by the time that class shall graduate, not more than forty or fifty will graduate. The question is what has been done with the others. They have received some instruction and have gone out to teach. Some have received instruction for one term, and so on throughout the course. I believe it to be a fact that almost invariably those pupils who come and take part of a course and then go and teach in the district schools of the State, I believe their influence is felt from one end of the State to the other — from Montauk Point to Lake Erie I can point to them. I have been looking up this very matter. I can show where they have taught in every town of the State. The question has arisen with the executive committee having charge of this Albany Normal School as to whether it is advisable to lengthen the course. It can readily be seen if only forty in two hundred graduate at the end of two years, by the time two years more were used up in the course it would be a great expenditure of labor upon a few people. That committee have not seen their way clear to lengthen the course in this school as it was established for training teachers for the common schools, and it is still such a school. It is a fact that the graduates of our school who take diplomas are not extensively employed in the district schools of our State. You will find them in various institutions — in institutes for the blind, at the house of refuge in which school there are normal school graduates, and so throughout the public institutions of the State. It is true that a few have left this State without teaching in the schools of this State, but it is a rare thing that any one of them leaves without teaching for some time here. But they have

gone where better advantages offered and so the whole Pacific coast is covered with them. Those I say who have diplomas are teaching in the higher schools more than in the common district schools. The trustees of these schools come to me for teachers. They say we want the very best kind of a teacher, and we want to pay seven dollars a week. I say, gentlemen, I cannot give you that kind of a teacher. One day there came in three honest farmers from the country and made such an offer. I said "Gentlemen, would you give more for a calf than for a steer?" One of them slapped his large hand upon his leg and said "that's so." When pupils come here from other parts of the State it costs them two hundred dollars a year for their board, and there is a good deal of expense. It cannot be expected they will come here and then go out and work for three or four dollars a week and their board.

(Some one asked whether Dr. Waterbury had in his data any means by which he could answer the question as to how long in the average each one of the 2,600 has taught.)

Dr. WATERBURY — Of the class of 1845, the first class graduated, twenty-three have reported; these twenty-three have taught 389 years. By dividing you will find the average for each. Of the first class of 1846, twenty have reported; of these, quite a number died immediately after graduating, but the rest of the twenty taught 143 years. Of the second class, twenty-two reported, who taught 381 years. You will observe as you come down the number of years increases. Of the class of 1849, thirty-four have reported, who have taught 387 years. When the question is raised that the normal school graduates do not teach, I beg your pardon but it is not so.

Principal CHENEY, of Kingston — I rise to thank Principal Waterbury for answering my question. I want the notion that has been repeatedly stated dispelled. I thought the principal would be able to set the matter right. I wish simply to acknowledge the debt that I owe to the normal schools, although I was never inside of one as a scholar, a fact which I regret very much to-day. I gained my experience as a teacher within ten miles of a normal school, and many teachers were obtained from that school, so I do positively know something of the work done in our normal schools. When our board of education was willing to pay for good talent out of the normal schools they were not disappointed once out of ninety-nine times. The normal schools are raising the standard of instruction, not only in the public schools in the city but also in the district schools throughout the State.

Principal HOOSE, of Cortland — I rise to call the attention of this body to one phase of the public schools which I think is not properly appreciated, and that is this: We talk about the rural or district school and the high school as though they were two distinct bodies or systems, when in fact they are both parts of one system of public schools. If the normal schools have any reason to exist at all it is to prepare teachers for the public schools. Now the tendency

of the public school in the State of New York and in the country generally is to leave the rural districts in a measure and gravitate to centers; gravitating to centers means to graded schools, the union schools with academic departments, the high schools. What could normal schools do if they did not recognize this tendency of the public schools? For the normal schools to confine their energies to rural schools, when the whole tendency is to gravitate to centers, is to stand at a certain point. It is for the normal schools to remain stationary when the world is getting away from that point. Up to 1866 or 1867 the rural schools had their history and their condition was not materially changed and had not been changed for a series of years. Since then the tendencies have been very marked toward centers. I have another point that I wish to make, Mr. Chancellor, and that is this in connection with normal schools. It carries out the point submitted by the author of the paper whether normal schools should do academic work, or professional work, or both. For myself I am quite free to say that I think the usefulness of the normal schools would be very materially increased if the academies and union schools had some organic relation with the normal schools to this purpose, that they could do the academic work more satisfactorily than they do so as to relieve us from the necessity of doing it, and leave our energies to be devoted particularly to professional work. The author of the paper, in his closing remarks, anticipated somewhat perhaps this position when he stated that the tendency is for the normal schools to do professional work. Well, as that tendency is to do less of the other, I should like to see the time come when there should be that organic relation — when academies and union schools should have a course of study approved, which course of study being followed by young men and women, they could enter the normal schools without further examination and enter their professional work at once. I know that in Canada they have recently introduced into the normal schools academic work, because the materials they sent up to them were not properly prepared. Still, I think we should not suffer by that organic relation. So, Mr. Chancellor, to come to some of the questions of the paper. Is it possible or desirable that the normal schools should be uniform? Without arguing that question it is sufficient to say at this time that in union there is strength, and the standing that the normal schools have to-day in the State and in the country I think has been largely influenced by the union which has existed among them.

Principal VERRILL, of Franklin — I represent the secondary school, yet I want to say a word in regard to this question of normal schools; and first, I believe that normal school graduates in this State do teach in the public schools, and I believe normal school undergraduates do teach in the public schools, and the more we look into these questions the more we get statistics, the more will the principals and faculties of normal schools be pleased. I dislike to hear it stated that the normal school graduates and undergraduates do not teach in the public schools of the State of New York.

There are other questions which come up of vital importance, whether we ought to be able to pass pupils from the academies to the normal schools. A student will come into the school and he will try to pass a Regents' examination and thus secure a Regents' preliminary certificate; those entering teachers' classes receive free tuition. If you wish for us to be able to pass them in academies so as to enter normal schools, all you need to do is to regulate the requirements for admission to the normal schools. I am heartily in favor of normal schools. I am heartily in favor of not having such a very great distinction in the qualifications necessary to enter teachers' classes in academies and to enter normal schools. If a Regents' certificate is required to be able to receive free tuition, ought it not to be required at the end of the first term in all schools? In all friendship to principals of normal schools, in all sympathy with their work, I ask how many students in the normal schools at the end of two terms of twenty weeks each, how many even then can pass a Regents' preliminary examination? This is a rigid examination, and so rigid that we cannot reach it in Delaware county. I wish we could reach it. I have advised young people to attend normal schools because I believe it to be the best possible thing for them to do; but I regret that in some cases they could not reach a Regents' certificate, and thus I could lead them on in our own schools and have them in our teachers' classes.

Regent McKELWAY—Mr. President, I wish to speak incidentally of a debt I owed to the normal schools. It was a normal school in the State of New Jersey to which I owed a debt of eighty dollars and which I paid for eighteen months' tuition in that institution. At the foundation of that school the principle was laid down by the law that the question whether the graduates or undergraduates would teach in the common schools of the State should be left wholly to the honor of the pupil, but that they should execute an obligation to the State to teach for two years in the common schools of the State. Failing to stipulate to do that they should settle for their tuition on the basis I have indicated. The operation of that principle was this. The men teachers if they were discovered by the scrutiny of the State Superintendent or by the county committee to be naturally unqualified for teaching were excused, but excused in a formal way, and it was put upon record; if they did not teach out the full two years, then the reasons and explanations had to be of the gravest character, such as failure of health or something of that kind. I assure you public opinion was such in that sterling little State that for a man who was able to perform his agreement not to fulfill it would render him universally condemned. Now I have to say a word with reference to the apparent difference between the academies and normal schools of the State, which is immense. To be explicit on this occasion I will say that the time has come when the principles of taxation for school purposes will be based upon rational not upon sectional principles in our Commonwealth. The time is not far distant when the State will recognize the truth that

for only two things should the property of our citizens be taxed. One is the common schools. The other is the normal schools which fit teachers for the common schools. I am glad President Waterbury has given statistics on this point; I am sure the time is coming when not only the present statistics will be taken, the period of teaching spread upon the records of the State, but that the degree of efficiency which they have will be set out. I believe that instead of wasting the public money, much of this money will be brought and placed in the common schools and some attention will be paid to industrial education — the education of the hand and of the eye as well as of the head will be carried into effect. We can see the methods of the nation which leads in educational matters — the German. Where can we find an American school where such a development exists. While normal schools are making teachers and the common schools educating the children of the people more and more in the mediums of learning it will complete that fabric of education for which the State will consent to tax the property of its people.

Professor BENNETT, of Syracuse — As a college man I long to see realized the delightful vision of this gentleman who has given us this excellent paper about normal schools in the future where preparation shall be made for teaching in the higher institutions. This is not a vision he alone has cherished. Earnest men have seen the complete failure of many otherwise abundantly qualified by study and investigation by earnest research for position in our higher and even collegiate institutions. Two years ago I suggested to Professor North, of Hamilton College, that the time had come when the Board of Regents had something to do in this matter. It is in the power of the educators of this State to do this. Our colleges want teachers better trained in normal school methods. We must have a central institution. This I do not say must come from the State. The necessity has, however, become more pressing. The time is not far distant when this will be done. I have seen such lamentable failures in our collegiate institutions of men who have spent much money—all their fortune, the best part of their lives, when they come to take a position they find out their inefficiency as teachers in knowing less of man, in knowing nothing of those laws that govern the relations of teacher and pupil, making ignominious failures. I have seen it to my heart's sorrow and I trust this serious defect may at a very early time be cured.

Principal COLE, of Troy — I certainly feel very kindly toward normal schools. I believe they are doing the work they are claimed to be doing; I cannot quite understand, however, how the standard of admission at Potsdam should differ so materially from the standard of admission in Albany. If a person who is capable of securing a preliminary Regents' certificate cannot enter the elementray class successfully every day in the week — I do not understand it. I entered a class in the State Normal School at Albany in 1848, was introduced to Dr. Woolworth; he secured for me a place to teach;

I found out I did not know as much as I should, came back in 1855 and finished up in the winter of 1855 or 1856 and was graduated. Since that I have spent a quarter of a century six miles from here in the service. I have been very near by. Have often visited this institution to see its progress. While it seems to me it has done successful work and has been obliged to do academic work I have sometimes thought it did not do enough technical or professional work. I was pleased to hear the paper call attention to the fact that normal schools are attempting to do more professional or technical work. They spend more time in teaching how to teach. Now does the undergraduate find this difficult while in the school? I had to ask for special permission not intended for general use. I was permitted to visit what was called the experimental, what is now called the model department, so that I might there learn. I did not see it in the normal school every day. I saw the students in the morning in the chapel, that is all. Went back to the country, taught school and "boarded around" for the summer-time and winter-time. I was elegantly and hospitably entertained by the good people of this county; and I taught for several years. I have also gravitated to one of these centers as suggested by the doctor. People in commerce, manufacture, editorial, literary pursuits gravitate to those centers. When I went to the district school every young man and woman who was unmarried went to the school certainly during four months in the winter; if they did not go it was a disgraceful thing. Now it is too much trouble. We must remember that young people— boys and girls must have arrived at the age of fourteen or fifteen years before they begin to learn a trade whether they learn to be carpenters, masons or any other trade. I believe the experiment they are making in Boston is a success in that direction. We must give technical instruction in the trades by competent instructors. If I am not misinformed the boy who goes into a shop to enter upon a trade does not learn it. He works for a year or a year and a half and instead of being instructed he gets little instruction. It is not any more as it was in the past when they had to serve seven years as they do in some countries yet. I think this industrial instruction should be fixed by the State.

President WATERBURY said: "In the normal school at Albany it is directed that didactics should occupy part of their recitation. Every student should have it brought to his mind how he has to teach the lesson he himself has to learn. And this should be done during the entire term, that is in the lower classes. One of our graduates reported that he has presided at and directed 834 teachers' institutes, and another one over 400. These are simply two sample cases."

THE REGENTS' EXAMINATIONS.

A PAPER IN THE MAIN AS PREPARED AND READ BEFORE THE UNIVERSITY CONVOCATION AT ALBANY, JULY 11, 1883.

By Principal G. C. SAWYER, of the Utica Academy.

In answering the invitation of the executive committee to prepare a paper upon this subject, I have touched upon the following topics: What is the object of examinations? What benefits are found by those engaged in school-work to accrue from the Regents' examinations? What are, on the other hand, the defects perceptible in those examinations, as at present conducted? What can be done to make them better serve the purpose designed? And, lastly, I shall consider the question of "equivalents" in connection with the studies required for securing the Regents' academic diploma.

It must be admitted at the outset that there are afloat notions respecting these examinations, which, whether correct or incorrect, claim consideration — the objections to be answered, if possible, and the merrits of the system to be carefully set forth.

FIRST. The purpose of examination at stated times, I conceive, should be to test the knowledge of the pupil in that particular branch of study, to show what he has done within a limited time, and whether he has grasped the principles involved so as to be able to apply them clearly, correctly and with a reasonable degree of readiness. It should be remembered in the preparation of the questions that these should not presume too far upon mature judgment on the part of the children, who are to answer them, although the object is both to train the judgment and to promote accuracy of statement. After considerable experience and farther inquiry I am disposed to think that the Regents' examinations have been useful in several respects. On the one hand the pupil is interested. He is led more carefully to review and to systemize what he has been studying, and to consider how to put such acquisitions as he has been making into forms of expression. The cards now issued after each examination are carefully kept, and all are desirous of adding a new topic to those already "passed." It seemed to me, according to my own observation, which has been somewhat extensive, that our students are thus encouraged to an emulation, generous and liberal in its nature, and without the disadvantages of a prize-system, where "many are called but few chosen."

Again, the effect upon the teacher is also marked. We may all have, as we should our own examinations and our own standards. These Regents' examinations are an additional help, if properly prepared, in furnishing a standard, and a general one, of comparison. We can see what other schools are doing and are led to revise our own methods, and to profit by failures that may occur. Teachers, as well as pupils, need to be stimulated. The fact that the examination is to come at a stated time and from outside is a gain in its

way. Even though any one's examination may not be better than one we should give, the very fact that the papers are *other* than our own has its advantages.

While, however, such examinations well conducted are beneficial to both pupil and teacher, and while it is admitted that our Regents' examinations are doing a good work in unifying our school system throughout the State, and helping to establish an "*esprit de corps*" among students and instructors, it does not follow that there are no defects, or that this system of examination is perfect. We meet here, I take it, as instructors and representatives of the schools of our State, in no spirit of mutual admiration, but as men who wish to aim to do better than we have yet done. I note, then, numerous complaints made not by mere grumblers, but by teachers who wish well to the system. A few have even abandoned these examinations, while several of our prominent high schools and academies still refuse to adopt them. What should be aimed at is to make these of such a character that all our academies shall be earnest to adopt them, because they will help them in classifying, and because they can be used as satisfactory tests of promotion in the school, and as fair and reasonable stimulants in school-work. I find complaints specifically both as to the quantity of work exacted within the given time, and the quality of the questions of the papers set before the pupil. On mature consideration I believe that there is justice in these criticisms and that these examinations can be improved, and should be improved in accordance with the views of all interested.

Turning, first, to the Regents' preliminary examination for which the certificate is issued, it may be said by way of criticism that here the papers should be so prepared as to cover the ground required in practical work. The aim should not be to see how much work can be squeezed out of the pupils within the eleven hours of examination. Said an excellent teacher of arithmetic to me: "Here I have been drilling my pupils in discount, alligation, partial payments, profit and loss; and lo! In this examination paper I find scarcely any thing upon these practical topics, but several long examples requiring great mental concentration, extraordinary accuracy, most minute care." A great deal of mere mechanical work, fatiguing indeed, was required; technicalities, such as "*stère*" (a term either not used in some text books or put into a foot-note) introduced, but the paper was not a plain straight-forward test of principles and of good sound arithmetical work! I know it is the intention of the supervising authorities here at Albany, that such mistakes as the one here cited shall not be repeated. Again, both in the preliminary and the advanced academic examinations the mistake is not infrequently made of giving too many credits to single and perhaps difficult questions. I have known pupils discouraged in the course of a trial of this kind by seeing ten or even twelve credits attached to one question, so that the whole number of credits for the paper being, we will say, *fifty-two*, a failure to answer this one would almost throw out the paper.

One notable defect, in my opinion, is the system of marking adopted. The plan is what I call "*exclusive*," in place of "*inclusive*," or, what may be better named, the "*destructive*," in place of a "*constructive*," system — being the terms employed by Eve in his excellent essay on "*Marking*."

"The destructive method, in its most primitive form, consists in accepting a maximum assigned by the authorities and deducting one for each mistake. * * * Why is the plan so obviously absurd? There are mistakes and mistakes. One mistake may involve a total misconception of the meaning of a passage, or a gross violation of a grammatical principle. Another may consist in the ignorance of an accessory word, or a trivial blunder in orthography. One may be a failure in reasoning, the other a mere deficiency in verbal memory. No reasonable person would put the spelling of "*adverse*" with two d's on a level with "*il a se levé*," or an error in the gender of *porticus* or *silex*, with *ut* and a subjunctive after a verb of declaring." *

To quote again from Eve's essay: "One may subdivide an exercise or a translation into a number of small problems and give marks for every thing that is right, which I would call the *constructive* method of marking, or you may deduct for mistakes from a given maximum, which we will call the *destructive* method."

In this connection I will say that I have in mind a paper on English grammar, which first "*passed* by marking on the destructive method, as above explained, while a much better paper was *rejected*, which, on a more rational or *constructive* method, should have passed. Let me explain further, as these two papers furnished an excellent test of the two systems and as I made a *test* of the matter with our authorities. One paper was badly spelled — badly written — ill-presented in various ways. Yet, by adding up the possibly correct answers and subtracting from the maximum of credits the minimum was first attained. On the other hand, the "*rejected*" paper was neatly prepared, the mistakes in orthography or in syntax were scarcely any, the more difficult questions were answered correctly. The questions omitted or incorrectly answered were, on the whole, the least important. It seemed as though any *one* (who was not an examiner, proceeding by some narrow rule), on reading through each of the two papers, must say one of these shows a fair knowledge of English grammar, both in the questions as answered and the form of answers to the questions as matters of good English (which, I take it, is a part of English grammar). Yet it was not thought best to allow this paper, though it was admitted to show a fair knowledge of the subject; but the decision at Albany was that "under our rules the examiner could not allow the paper to pass, according to our method as adopted." "*Tant pis!*" So much the worse for such a method!

I will add another instance for illustration, taken from one of the

* "On Marking," by H. W. EVE, M. A.

advanced academic examinations. The whole number of credits, we will say, may have been *ninety-six*, for a paper on Homer's Iliad. The number of credits assigned not unfairly as the maximum for the translation of one passage was, perhaps, *twenty*. The examiner proceeded carefully and accurately, first by the *destructive* method. For a slight misrendering, here, a deduction of one; for a trivial omission, there, a deduction of one; for another omission, a deduction of three; for another translation of a line or two somewhat faulty, a deduction of four; for misrendering a *tense*, another deduction, etc. Net result of deduction, we will say, *thirteen*, leaving only *seven credits* for this part of the work. Proceeding a little farther this *destructive* method might have eliminated *all credit* from the passage, while yet it might have remained half right, or entitled to ten credits. Am I unjust or hypercritical in affirming that by this one example I have proved a *reductio ad absurdum* in the case of this system of marking? As it was, I thought the passage, *on the whole*, was worth, as containing some felicitous renderings of the thought and spirit of the original into excellent idiomatic English, in spite of some mistakes, seventy-five per cent, or *fifteen* credits. But the examiner not agreeing with me, the paper was returned "rejected," though my marking of that passage would have passed it. Curious to see whether I had fallen into the habit of thinking "all my own geese were swans," I sent the paper to an eminent "Grecian," and requested his opinion upon the boys' rendering of the passage in question. His answer was that "though somewhat faulty (in the places you have pointed out) the rendering of the passage has the true *Homeric ring*. He added that of course he "could not determine what mark the paper should have, not knowing what method was adopted at Albany." Now my contention is that on an *inclusive* or "constructive" method of marking, not only should there be deductions for mistakes but positive or *plus* credits be given for excellence in some points which may serve to counterbalance other defects. As, in this case, a translation having the "true Homeric ring" should, on a fair, a just method of marking, tell as put against mistakes, and these of a trivial kind. My conclusion is that the method of marking in the Regents' examinations needs revision. I will here introduce a suggestion leading to such revision, as also expedient on its own merits. Put, as far as is practicable, into the examination papers, *extra questions* at the end of the paper. If the pupil does not touch these well and good. The credit of the rest of his paper is not to be impaired. But for as many credits as he can gain for answering these "extras" let these go toward making up deficiency or mistakes in the first part of the paper as "required." A beginning at least may be made in this direction in the classical papers. Much is now done in our best schools in the way of sight-reading. I recommend that to the two more advanced papers in Latin or Greek there be appended a passage taken from some non-required portion of the works of the author under examination, to be read at

sight. This passage should be more liberally or less critically marked than a required passage, failure to render less usual words that may occur, for example, being treated leniently, especial attention being paid to an appreciation of the idioms and a good, careful rendering of the Latin or Greek into idiomatic English. At first this may be treated as an *extra, i. e.*, allow several credits therefor — as much as for one of the required passages — allowing these credits to make up for defects or errors in the other parts of the paper, but making no deduction if the extra is not attempted.

Turning next to another feature in the method of marking as at present adopted, I am decidedly of the opinion that for such papers as are actually set, and should be set especially at the advanced academic examinations, seventy-five per cent is too much to require in the way that the answers are now marked. While expecting to be met by some with the charge of "lowering the standard," I cannot agree with the way in which this topic is treated in the *"syllabus." After fairly enough touching upon the imperfection of and difficulties incident to any written examination, it is there stated that "the Regents have endeavored to obviate these difficulties by giving a wide margin for errors arising from such causes. They agree to pass papers even if one-fourth of the answers are wrong." I should put it rather thus: Let us hold that the average pupil retains three-quarters of what he has studied in a certain branch of knowledge. Then, starting on an examination thus equipped, it is fair to presume that amid the difficulties and embarrassments well set forth on page No. 3 of the syllabus, the average pupil will be able to present well about three-quarters of that actual knowledge then possessed. This would leave a required minimum of fifty-six per cent, falling below which a paper would not be received. I find that a large number of people, both professional and others, to whom I have stated the case, accept this calculation of mine as more reasonable than that of the "syllabus." In this connection I note for comparison that in the examinations for admission to Harvard University *fifty per cent* is the minimum, while this is also the minimum that seems to be adopted by English examiners; our "Civil Service" commissioners have adopted *sixty-five per cent* as their minimum. Actual inspection shows that the papers as set by the Regents in both the chemical and mathematical papers are as difficult as are those set for admission to either Harvard, Yale or Amherst. What advantage or expediency is there in the Regents requiring a higher standard, when one of the purposes of these examinations is set forth to be to insist upon a uniform standard of scholarship, and to issue certificates, as a result of such examinations, which shall entitle those who have passed to admission into any college of the State of New York? It is claimed that the colleges of this State require a higher standard than do either of the above colleges. But the syllabus adds, "The Regents have no de-

*See "Syllabus of the system of examinations as conducted by the Regents of the University."

sire to make them (these examinations) easy. They aim to make them a test of liberal scholarship, etc." "They desire to make the certificates, which are dependent on successfully passing these examinations, honorable testimonials of high attainment." Very good. No principal of any one of our academies desires otherwise. But, at the same time, my contention is that these trials shall be such as the good, average pupil shall have a reasonable prospect of passing. They should be *inclusive* not *exclusive*, for the considerable number of intelligent, earnest students, not for the few A No. 1 prize scholars. This is the opinion, I know, entertained at some of our best and largest academies, where, even without the Regents' examinations, other test examinations would be and still are held at stated times during as well as at the close of the course. Now, if at such academies of high repute, and which can stand on their own bottom, these *other* examinations are held taking up so much time (three school weeks) both of the pupil and the teacher, it is fair to expect that they shall be able to be largely used as pass-examinations, or as helps at least to promotion from class to class, or shall be examinations similar to these in character, and also such as in any school of reputation pupils would be required to pass before receiving the diploma of said institution. This is about what I know some of our best academies are thinking and experiencing. A failure in some respects to comply with the above particulars has led some of our best schools either not to enter these examinations, or to give them up after a trial, as not on the whole conducive to the best results, and compensating for the large amount of time spent and the additional care and labor involved.

Turning next to the topic of "equivalents" to be allowed in making up the number of required branches for the Regents' academic diploma, I observe that there is reason to commend changes that have been already made designed to make the course of study more feasible, and I shall recommend other "equivalents," which I trust will be accepted with the same end in view. Why not make the same amount of *Greek* an equivalent in substitution, as is Latin already, for any three subjects? I should myself be willing to see equivalents also accepted for either algebra or geometry. I am of the opinion that equal mental training and for many minds more lasting profit would be gained by the study, for example, of structural botany, or an additional language. Moreover, it is the opinion of many instructors and parents, when there is the opportunity of instructing the many who will end their school days with the academy, that too much time is given to the mathematical studies, to the prejudice of either the sciences or the modern languages, while for those who are preparing to enter college, an advanced knowledge of mathematics is not required, as these studies will be further pursued at college.

As the time came when neither Latin nor Greek were considered as to be required among the essentials of education, so I believe it

will come to be with algebra and geometry. Here I would not be misunderstood. No one will insist more than I upon the importance both of the classics and of algebra and geometry as studies to be pursued and strongly recommended. The classics, however, in our academic course are not largely insisted on, but are merely allowed as "equivalents." I desire to state emphatically that I see no more reason why, for the average student, these two branches of the mathematics should any more than the classics be regarded as essential. This, I know, may be regarded as revolutionary doctrine, but I stand by it, and I expect in no long time to see it adopted by this convocation as called for by public opinion. How many of our pupils in after life make any more use of their algebra and geometry than of their classics? I may rather ask, when we consider how intimately connected the classics are with our modern languages, and how much they lie at the basis of or are closely interwoven with modern thought, literature, art and institutions, how much less really will be the real use of the one as compared with the other? If we speak of the mental drill of the two comparatively we need only quote such authorities as Mill and Hamilton, and may indeed affirm that the study of the modern languages or of several of the sciences will furnish to many minds as good an exercise of the mental faculties, and also be productive of more lasting satisfaction. Why not, I repeat, allow equivalents either from among the sciences or the languages, classical or modern, for algebra or geometry, and style the diploma granted for studies, with these omitted, the "Literary diploma"? I can see no rational objection thereto, and permit me to say that many discreet and well-educated men and women, among them college graduates, agree heartily with me in this opinion. I present this, then, emphatically as a farther means of liberalizing and rendering more feasible and popular our already excellent course of study requisite for the advanced academic diploma.

As in some of our academies the advanced mathematics can at present be more advantageously studied than some of the sciences, it may for the present be recommended that two papers be set, both in algebra and geometry, one including only what is needed for entrance to college, while the others shall be more "advanced" papers, and shall be put among the "optionals" or "*substitutes.*"

Touching the papers on the "French" and "German," I suggest that on making out these papers, inasmuch as the translations are at sight, that the subject of each translation may properly be given as a heading in English, and that a short vocabulary be furnished of the less usual words that may occur in that passage. In general it may be observed respecting these translations that, as being at sight, they should be so marked, that is, less strictly than would be translations from authors, whose works the pupil is supposed to have previously read.

Turning next to the Regents' papers on history, I note that the domain is here so large as to require that the questions for exami-

nation be framed so as to be at once comprehensive, and yet so specific that no vague answers shall suffice. No careful schoolmaster, who looks for well-defined results, will be satisfied with indefinite questions, which shall appeal merely to the *general knowledge* of the student, which, as Froude has said, is often but another name for "general ignorance." But, on the other hand, the less public and the less important, the minutiæ of history are not to be insisted on, and to insert these into a pass-examination is to insist upon them.

In a paper on American history, for example, when very properly introducing the topics of steam navigation, I would deem it too *minute* to require, as in a recent Regents' paper, "the *name* of the first steamship launched successfully by Fulton. And partly for this reason. There is what may be called a "saturation point" of the memory. An English botanist tells us that he can retain in his memory at any one time about 7,000 names of species of plants. If he tries to remember additional names about an equal number of the others already learned drop out. As a consequence, care should be taken not to load the memory with the useless, or the comparatively useless, for by so doing the more useful will be extruded. The name of an inventor with the approximate date may justly be insisted on, but to remember that the name of the first steam-vessel was "The Claremont," is what I call uselessly loading the memory. I am not sure that I now have the name correctly, and I am sure that I do not care to cumber my mind therewith. Does the examiner who puts such questions recall an answer given even before these modern times of enlightenment and examinations that seems to me pertinent to this occasion? When asked what he would have boys taught, a wise man of antiquity is said to have replied: "Those things that they will use when they become men." This maxim seems to be specially applicable in the study of history. I would ask questions on topics that men care to hear about and follow farther. Examine on the broader lines of thought and action. Bring out those events, ask about those men, directly connected with National life and with human progress in their varied phases. I agree with the English master Moberley that "a fact by itself is a barren thing." Do not let an examiner mouse about, and hunt up and put into his paper some *trivial* or *isolated* fact, some comparatively unimportant name that signified little, merely, perhaps, for the sake of making a *new* examination paper! For a test-examination by which a pupil is to stand or fall, examine him or her on what they are properly and naturally expecting to be questioned.

Similarly, for questions of etymology in a Latin paper, I would choose those having a general bearing, as the meaning of the verbal suffixes in *agito*, *capeno*, of the substantive suffixes in *aerarium*, *facultas*. But, while in the recitation in class room I should deem it in place to call attention to the derivation of *incassum*, I should not expect to meet with it as *required* in a Regents' examination

paper on Virgil, as I once did, where the loss of this one "credit" might have *rejected* the paper of a pupil. Thus, if any thing like the average of seventy-five per cent is to be retained as the minimum that shall *pass* a paper (instead of sixty-five per cent which I deem to be a high enough figure), all such incidental or minute questions as the above, interesting though some of them may be, must be rigidly avoided, or relegated to the place of "extras" at the end of the paper.

As to the papers on Latin and Greek I often hear it said that the *first Latin*, where the selections are taken from Cæsar, is disproportionately difficult for elementary work. Too much work is put into this first examination. I should say that the three classical papers can be better graded upwards from the elementary to the more advanced topics of classical study. I take occasion once more to strongly urge the addition of passages "at sight" to the classical papers, and express the hope that no papers shall in future be set on these subjects, where passages for this practice shall be omitted.

I have endeavored in these remarks, on the principle that "plain words are best," to set forth practical suggestions upon the topic assigned to me for treatment. As an instructor of twenty-five years' experience at my present post, I am interested with you jointly in all that pertains to the well-being of our schools. I have always myself used to a certain extent written examinations as helps and tests of accurate scholarship. I know from long and intimate correspondence with the authorities at Albany, that the Regents and Secretaries cordially accept suggestions on these and other educational topics, and that they are jointly interested with you all and yourself as teachers, that these examinations as they have already served in the past to promote the best interests of our academies and colleges by constantly and steadily leveling upwards, so shall be improved in efficacy. It is in this belief, and as a fellow-worker, that I have made the above suggestions and criticisms, and not one of them is meant in a fault-finding spirit, but all are put forth as practical suggestions to be taken for what they are worth, with the expectation that they will in turn be subjected to searching criticism, and only those be adopted which shall commend themselves to the judgment of the conscientious advocates of progress and the sound sense of skilled instructors.

What I do want, and I know others who have the same desire, is that those of us who maintain these examinations shall see them constantly advancing in usefulness, made more and more practical — that any and all defects be gradually and surely eliminated, that while becoming more flexible those examinations shall be kept sound and thorough tests, yet inclusive of all fair average scholarship, not meant for the few only, so that, in no long time, no academy in our State can afford to dispense with or to be left out of these Regents' examinations, whether the preliminary or the advanced academic.

Principal FLACK, of Claverack — I wish to indorse in a few minutes very heartily all the criticisms of the speaker. I believe that the Secre-

tary and the Assistant Secretary do not at all object to such criticisms. Now I want to say just here one word further. I know it is proper to ask right here, what have we done to raise the standard; that was a point essential to be met. Sixty-six and two-thirds is not too high; we want as much as 75. We want to get on a higher level. I was glad to have the standard brought up. It has been my fortune to be a teacher many years, and during the last year I was present at the graduating exercises of Harvard. If the general average paper will admit them to pass, the higher standard on another paper will permit them to pass. The point I make in reference to carrying it at 66⅔ is that it is not too high and I believe in that or what is equivalent to it. We are quite an institution; we cannot be said to be lowering the standard at all. It is only a question of the methods of how to do this and whether to make it 66.

Dr. PRATT — Harvard will admit a student upon forty right straight through.

Principal FLACK — Now I want to add a point that seems to me very practical and important in these examinations and the examinations in Cæsar. I know that the teachers know Latin enough to pass through the grammar and the reader and Cæsar. I insist upon the fact that these classical scholars study three terms of Latin with at least three examinations; the science scholar that studies one term in philosophy, one in chemistry, one in botany, in all three terms, I know will answer, "We have so many studies that we cannot get this Latin grammar and this Latin reader," and some of these scholars have studied six terms. The criticism we have had here is very just. That Latin paper needs six terms' study for the examination. I do not make any objection, but it is not fair in Latin to have six terms; it is not fair in Greek to have four terms before we have an examination. We do not read our Anabasis until our fifth term. I do not think the authorities have any feeling about our making these suggestions. We have met in private. They give the answer, we have so many papers; we want to be just to Latin and just to Greek too. Hence I make this point, Mr. Chancellor.

Principal FARR, of Glens Falls — I wish to say a word on this subject. When the syllabus was sent out it stated that there was to be an examination on the map of Gaul. Consequently, we placed a map of Gaul before our pupils at the beginning of the study and yet, when the year came round, at the examination in Cæsar, it was not used. Now, in regard to the provision for increasing the examinations in Latin. I for one would be exceedingly sorry to have any more examinations in Latin than we now have. I would like, if I could be allowed, to make one criticism in regard to this gradation of these classical examinations. It has always seemed to me that the Regents required in these examinations almost as much knowledge of the language in Cæsar as in Cicero or Virgil, and have often wondered if it would not be possible to have a little lowering in the standard of Cæsar and lowering in that of Cicero, so that there

shall be a more marked gradation from the first to the last. It seems to me if that change could be made it would make them even more serviceable than they are now.

Principal G. H. STILWELL, of Lisle — In this discussion I only hope to represent some of the smaller union schools and academies of southern central New York. I am sure I shall represent these schools in indorsing in general the paper that you have just heard. I am sure I shall represent these schools in indorsing *most emphatically* that part of the paper which refers to the blind, technical and impractical question found in the Regents' examination. Our scholars from time to time for years have criticised the Regents' questions for these defects. They object especially to questions calling for latitude and longitude of given places, to questions requiring the writing in Roman characters of numbers larger than those the arithmetics have required them to write, also especially to many questions which are either blind or ambiguous in meaning. We all also have grievances in reference to the marking and rejection of examination papers, but them I consider minor matters. In general, I consider that the Regents' examinations are doing a great work. The students who come into the union schools from the rural districts come with an unbalanced education. They are usually proficient in some one branch, but deficient in others. One great effect of these Regents' examinations has been to so shape the courses of study in these union schools as to require these students to round up at once their education in the common English branches, so that all students who leave our union schools are at least in some measure proficient in these studies, and it has often occurred to me that it would be advantageous if, by some requirement or by some inducement like the Regents' examination, we could go down below the union school into the common district schools and require students there to keep their education balanced all the way up.

Again, plainly, the Regents' certificates are both a just and wise measure of determining how the public moneys belonging to the higher schools shall be distributed. Just, because those schools which have the greatest number of Regents' scholars and receive annually the greater number of Regents' certificates, are the ones which are doing the most and best educational work for the State and so entitled to receive the most help. It is wise because it so distributes the money as to incite school officers and teachers to make continually their work more efficient.

I for one rejoiced when the Regents' preliminary certificate was made a requisite for admission to the State teachers' class. I rejoiced because it did away with that slip-shod method which admitted anybody and everybody to the class without regard in the least to education. Teachers' classes for years in many schools have been a farce, but under the present system such a thing is impossible. I also rejoiced when reading was added as a requisite for the preliminary certificate. I rejoiced because it meant that new attention was

to be drawn to this important branch of elementary education; but I shall rejoice very much more when the examination shall be made more strict and searching, when the question of the student's passing or not shall not be left wholly to the examining committee. Cannot the Regents institute questions on diacritical marks, punctuation, inflection, modulation and other things necessary to proper interpretation of a selection, etc., which, taken with the reading of a passage, shall determine the student's standing? This method will leave the question of the student's passing, the same as in other studies, largely, if not wholly, to the Regents.

It has struck me after that, if possible, that some greater inducements should be held out to encourage students to try to pass the Regents' examination. It appears to me that the encouragement is all on one side. Boards of education are encouraged to have these students obtain these certificates by offers of gifts of money, but in general ask students to tell you the advantage of holding a certificate, and they cannot name one. I think it might be a help if the Regents' preliminary certificate should be considered as an equivalent for having passed a school commissioner's examination in these studies. In some cases the desired result would be accomplished if the student, when foreign to the district, be granted free tuition for one term or more. However, I think on the whole the Regents are doing a great work. They have the lead and the schools are bound to follow. And this is one of the greatest thoughts to me that whenever the Regents wish to draw attention to any special subject all they have to do is to insert questions in the Regents' examinations. The Regents wish to attract attention to the metric system and they insert the questions in the examination papers, and all the schools commence working up to that standard. We rejoice at the changes that have been made during the past year, and hope that with a few more changes we shall have a system that shall work to perfection.

Principal VERRILL, of Franklin — I liked the admirable paper of Principal Sawyer, of Utica. I listened to it with a great deal of attention, but I am surprised that he suggested that 66⅔ per cent instead of seventy-five per cent, for seventeen years ago when these examinations were introduced the requirement for them was fifty per cent. Since then it has greatly increased. If lowered now to 66⅔ per cent, I apprehend that in the examinations of pupils in many of the schools of the State there would be a great falling off, and the per cent would soon have to be lowered to sixty or even fifty per cent. I do not suppose the gentleman would recommend that; two-thirds of us would be glad to see it raised to ninety per cent rather than lowered.

I apprehend a good deal of difficulty that comes up during these examinations is unavoidable, and I challenge any one to find fairer sets of questions published. It is not to be expected that somebody else can rate questions on the same rate in which I have drilled my class fora number of years. The State Superintendent of Public Instruction once came in and was present at the

examination of my class, and he was satisfied with the examination —I felt he was. The first question he asked a boy was this: "Will you please *enunciate* that proposition again?" The boy did not know what he meant. I had never made use of that term. I had said "State the theory." I believe this criticism that comes in with reference to these examinations is not valid. We could not agree with the Secretary of the Board with reference to these questions — you could not by any possibility appoint a committee of five who would agree on the questions. I do not believe you can appoint a committee of five to make up the questions and have them as good as they are now. Now take the term "scholar." I wish it were abolished from all the Regents' work. That term does not apply, yet everybody understands what it means. Some expressions our pupils fail to understand. I do not think it is in the range of the human mind to put questions so that boys and girls of fifteen, sixteen, seventeen and eighteen years of age can always understand just what the questions mean. It is not within the range of the human mind to put these questions so that the pupils shall always get clear conceptions.

Secretary MURRAY said — Before the discussion on the subject of the Regents' examinations is closed I desire to say a few words. There are two points which ought not to be forgotten in regard to these examinations. The first is that the primary object of their establishment was not to affect the standard of learning in the academies, but to furnish a basis for the distribution of the literature fund. The preliminary examinations were begun for this purpose in 1866, and subsequently, by a law passed in 1880, the advanced examinations were also made a basis for this distribution. The second point to be kept in mind is that in all their measures for the management of these examinations the Regents have always relied for counsel and aid upon the members of this convocation. What they have done and what they have refrained from doing have been in reference to what was believed to be the sense of the convocation. The subjects on which examinations are held, the extent and character of their examinations have been determined after consultation with the wise and able committees from this body. And this is the attitude in which the Board of Regents stands to-day. The discussion of this subject has been solicited for the purpose of learning what the principals of academies have to present in relation to their experience during the past year. It is only by this free criticism which is always welcomed, that the Regents hope to make these examinations a continued benefit.

With regard to the special points that have been criticised in the paper of Principal Sawyer and to some exetnt in the discussion, I wish to refer to one or two only. The question papers have been criticised as sometimes too technical. Now this is an easy charge to make, and there is a sense in which it is a serious fault. But I wish you to consider how you can put questions upon any subject which shall be in the least suited for tests of scholarship without making them in a sense technical. Suppose in the subject of American

history we avoid what you will call technical questions and put our examination in such form as this: "Give an account of the Revolutionary War;" or "What can you say as to the discovery of America?" These are broad and comprehensive questions, but what kind of results will they show? Pages may be filled with loose talk about these topics without furnishing evidence of any adequate knowledge of the subject. It would be equally a failure if you attempted the same system with any of the other subjects. Experience has shown that in order to make your questions a test of scholarship you must make them definite. You must distribute these definite questions over the different parts of the subject so that the answers will show whether the candidate has been fully instructed. It is not necessary that the questions should touch upon all that has been learned of a subject, but to be so distributed as to prevent the neglect of any essential part. What we want is not general questions, but test questions. As the merchant tests the bale of cotton by picking from it a sample here and a sample there, so we ask from the examiners a question here and a question there upon the subject under examination and determine from these test answers the sufficiency of the knowledge attained.

I will say also in relation to the system of estimating the merit of papers which has been referred to, that to a certain extent a numerical standard for marking them is absolutely necessary. But after all this numerical standard is intended quite as much to guide principals in determining the papers to be forwarded as for the office in accepting or rejecting them. The decision in the office is intended to be made on honest principles and to allow evidence of attainments of whatever kind it may be. I think, therefore, that this system of determining the sufficiency of papers as practised in the Regents' office is not open to the objection of being destructive and not constructive.

I have only to add in regard to the standard required for passing papers that I would regard it a calamity if we were compelled to lower it. The schools have nobly struggled up to this standard and it is recognized as one of the great advantages of the examinations that scholars and teachers alike have had the stimulus of the effort necessary to reach this standard. Now that you have fairly attained this altitude and feel the invigoration which it imparts, I am confident you do not wish to come down again. I think you ought to remember one distinction between these Regents' examinations in the academies and examinations for entering college to which reference has been made. It is that while a young man on entering college expects to pass on all the subjects, ten or fifteen of them, all at once, or at most at twice, in the Regents' examinations he is permitted to take them in detail and continue his trials as long as he pleases. It seems to me to make a material difference, and to make it entirely proper for us to expect and demand a higher percentage on these separate and extended examinations than would be properly admissible if a candidate were required to pass in all at one trial.

A TERM'S WORK IN ENGLISH LITERATURE.

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It is not the object of this paper to present an ideal course in English literatnre. Ideal plans imply ideal conditions. With literature such plans demand an ample supply of the best books, classes interested and well prepared for the work, and adequate time for a systematic development of the subject. As a rule these are not the conditions given. The library is deficient; the student indifferent; the time limited.

The practical question is, therefore, what in the circumstances is the best that can be done? To answer the question in part is the aim of this paper. A supposed lack of time is probably the most common reason why English literature has so often no place in academic instruction. The circumstances, however, must be unusual that will not permit its study at least one term. Especially is this the case when, in connection with the subject, may be carried on with advantage a valuable part of the work in rhetoric and elocution.

For several years the general curriculum of the college with which the writer is connected allowed only one term for class instruction in English literature. The course, he is glad to report, is now largely extended. Still, some of the methods that were devised to meet the former limitations of time have proved so useful as to claim a prominent place in the enlarged and more thorough course. Recognizing the difference between a class of sophomores and a class of ordinary academic students, the writer hopes that a brief statement of some of these methods may not be without helpful suggestions to those who teach this subject in our high schools and academies.

The skeleton of any satisfactory course in English literature is necessarily the history of the subject. But, like other skeletons, it should not be made too prominent. The strange distaste that the student sometimes has for this delightful study can be usually traced to an acquaintance with only its skeleton. But if it is the literature itself that gives life, interest and attractive beauty to the subject, yet, as its framework, the historical element has important uses and must receive attention.

With the class mentioned this part of the work was made largely an exercise in composition. The number of recitations in English literature for the term was sixty. The work outside of the class room for a third of these exercises was devoted to the history of the subject. For each of the twenty recitations a period or writer, or group of writers, was assigned. In description of the period or writers so designated, each member of the class was required to prepare an abstract or essay. The facts stated were to accord with designated authorities. This language and method of presentation of subject, however, were to be wholly the student's. Apart from accuracy and thoroughness, the value of the work depended upon excellence of style and original arrangement of facts.

The value of the work was not simply rhetorical. Without warning, the class was, at times, questioned with care as to the periods and writers considered in these papers.

These examinations showed a better mastery of the subject than is usually obtained by means of recitation from the text-book. Not to lose wholly the benefit of text-book drill, between five and six hundred questions, relating to the periods and writers studied, were prepared in printed form; and their definite answers as given in the works selected required in review. These review exercises were the only recitations in regard to the history of the subject that were made in the class-room. They were ten in number, and with the twenty abstracts prepared in study hours, they constituted the work in the historical part. This part extended from the Elizabethan age to the middle of the present century.

The questions for review were limited to three different text-books. In preparing the written exercises, however, students were encouraged to extend their examination to other authorities. This was frequently done, so that the papers represented the daily comparisons and study of several standard works on English literature. To secure this kind of work, in some measure, from every member of the class certain subjects were assigned for written discussion. More than forty in number, the subjects of these discussions were such as to lead to the acquaintance of much that is most valuable in our literature. After the first few recitations each exercise opened with the reading of one of these discussions by two members of the class; one representing the affirmative, the other the negative.

Perhaps at this point the difficulty of the student obtaining books for the satisfactory preparation of such papers may suggest itself. Pardon the writer while he refers to his own experience. With a general college library of many thousand volumes, he yet found it wanting in many of the books most needed by his classes in literature. Even if such books belonged to the library they were often, when the members of his class had occasion to use them, in the hands of other students. He, therefore, determined that the classes in literature should have their own library. By quiet but persistent importunity, to use a long word for begging, there have been collected in six years, for this purpose, nearly two thousand volumes.

While the library contains at present no works especially rare or valuable as original editions, yet all the books have been selected with particular regard to the needs of such classes. The collection includes not only much choice reading and a large number of works of reference, but all books necessary for class-room use. Thus, in the examination of a play of Shakespeare, an essay of Bacon, a poem of Milton, a satire of Pope, or a selection from Addison, each member of the class is furnished with a copy free of expense.

Perhaps not so large a collection, in the same time, can be ob-

tained for many of our academies, yet results in kind if not in degree can be reached, we believe, in every village having any interest in literary culture. A little labor with some wealthy and generous patron or patrons will supply the nucleus. This gained valuable accretions will come with time. The collection at first may not exceed two or three hundred volumes, yet let these be well selected, and they will be of untold benefit to the class in literature.

Returning to methods of instruction it is seen that of the sixty exercises of the term, but ten recitations in the class-room have been devoted to an immediate use of the text-book. These were the ten recitations and the questions reviewing the history of the subject. The student has, therefore, left for other work in this subject fifty recitations in the class-room and thirty exercises to be prepared in study hours.

The time inside of the class-room reserved for these thirty exercises and a large number of recitations were given to the study of the writings of representative authors. A number of Shakespeare's plays were studied. Neither time nor the general purpose of the course would permit this work to be, in any proper sense, critical. Questions were prepared that called for the students' estimate of different characters; for original comparison with the characters of other plays of Shakespeare, or characters of contemporary or later dramatists. The questions called for the relation of the action of the play to its characterization; for the significance of historical allusions; for the occasion and attendant circumstances of certain quotations; for the meaning of many of the words, especially such as illustrate the life of the times. While not philosophical nor, as has been said, in any marked manner critical, they required a careful reading and study of the plays. Nor is it too much to add that they accomplished their purpose, namely, to interest the student and to give him a general literary acquaintance with these masterpieces.

In the opinion of the class, one of the most difficult exercises of the course was the analysis of a number of Bacon's essays. This analysis, as all instructors who have tried it know, is valuable not only for its rigorous mental discipline, but also for its help in teaching the student how to plan and systematize his own literary work. In fact, according to the experience of the writer, the most effective way of teaching rhetoric is by a course in English literature.

"Paradise Lost" is often praised but rarely read, it is said. In the case of this class the saying was disproved. Two books were read aloud in the class-room. Work was required that compelled also the thoughtful reading elsewhere of the four other books. "Lycidas" was examined line by line, and word by word, in the class-room. "Comus" was read aloud, with the parts assigned for previous study. One or two subjects of the discussions brought to the attention of the class some of the prose works of the same author.

Other writers were studied more briefly. Care was taken to vary the exercises, so that exactly the same method was rarely followed

with any two authors. As the work could not be exhaustive, even with regard to the examination of a single long selection, the aim was to make it suggestive, and it was hoped, introductory to the student's private study of the author, at some future time.

One exercise a week was given to dramatic readings. These readings were popular and awakened general interest. With not a few, it was the origin of the first enthusiasm for the subject. The plays were so arranged as to bring them within an hour's presentation. The parts were given out some time in advance; and the principal readers drilled for a proper interpretation of the characters.

The class read together not only several of Shakespeare's plays, but also came to know something of different periods of the English drama by reading Massinger's "New Way to Pay Old Debts," Otway's "Venice Preserved," and Goldsmith's "She Stoops to Conquer."

The most profitable exercise of the course, however, was one of which we are now to speak. To it was given a large part of the time that had been gained from the recitation hour by the student having prepared and handed in his work in written form, as has been explained. The exercise was the reading from an author by a member of the class, while the other members listened with the understanding that some one of their number would be called to reproduce in his own language what had just been read. During the term, among the works so read were all of Thackeray's lectures on the English humorists; Macaulay's essays on Milton, Bacon, Addison, Dryden and Byron; Carlisle's essay on Burns; the most valuable parts of Dowden's work on Shakespeare and Stopford Brooke's on Milton; a number of papers from the Spectator; several extracts from Goldsmith; different selections from the poets, and a variety of literary criticisms by representative writers.

These readings were, so far as possible, arranged in connection with the work prepared outside the class-room. While Addison and his writings were the subjects for the written work, the reading at the time of recitation was from Thackeray's lecture, or Macaulay's essay, on Addison.

The discussion also that opened the exercise related to Addison's responsibility for the quarrel between him and Pope.

It is plain that such readings give the instructor a frequent and useful opportunity for comments, explanations and even short, informal lectures. These lose nothing in points and interest, because they seem to be suggested so naturally by the allusions or statements of the page just read by a member of the class. If the instruction is without the usual didactic form, it is, perhaps, for this reason, no less enjoyable and effective.

That the exercise is excellent elocutionary training for the reader is apparent. To have his elocution satisfactory to his classmates who are to reproduce what he has read, he knows he must read distinctly and intelligently. With no tricks of voice or affectation of manner he must

make it his one effort to bring out the thought and sentiment. Not unfrequently the student who has won honors in formal declamation, or has been particularly impressive in dramatic readings, finds he has a new lesson to learn before he can read with approval the quiet essay or page of subtle criticism to listeners anxious to catch the significance of every sentence and word.

But if the exercise is of benefit to the reader, far more is it so to the hearer. A habit of attention is formed that develops into a rare power of concentration of mind. If, when summoned to state what has been read, the student would not be with vacant mind and speechless tongue, he must indulge in no wool-gathering, no listlessness of attention.

Nor is the work of reproduction merely a matter of memory. As the words of the author are not allowed to be reported beyond what is strictly necessary, the student must have every faculty alert to master the sequence of thought and to assimilate the ideas that he is to restate in his own form of expression. To illustrate how far this quickness of mind and ready grasp of numerous and difficult statements were carried, the writer has sometimes called for the reading of three pages of Taine, representing his rapid enumeration of strange particulars, his subtle analysis or broad, sweeping generalizations. Without other preparation than simply listening to the reader a student has reproduced what has been so read, in his own language, with no important break in the continuity of thought, or marked departure from the author's meaning.

To say nothing of the general, mental discipline so gained, this quickening and sharpening of the mind is not without its influence for good in the work of literary criticism. The writer has had from students no finer estimate of the style of Macaulay, Thackeray and Carlyle and other authors, than have come spontaneously in connection with this exercise.

Here, again, is a means of rhetorical training. The almost instantaneous translation of the author's meaning into the student's form of speech helps to a facility of expression not always acquired by the slower processes of written composition. The power gained, as the phrase is, to think on one's feet — this ability to hold in mind a long train of thought and to command words for its immediate statement — is often seen in the ease with which the student engages in extemporaneous debate the following year. Having charge of both exercises, the writer frequently observes with pleasure the close connection between this work in the literature class, Sophomore year, and that in extemporaneous speaking, Junior year.

Reviewing the results of such a term's work, there are none more in accord with the purpose of the course, than the change, on the part of many members of the class in literary tastes. From the time of that term's work to the close of Senior year, the books charged by the college librarians to such names, give evidence of a steadily growing acquaintance with the best works of our literature.

In closing, it is to be repeated that this paper has not described an ideal course in English literature. Such a course cannot be limited to one term. But, as in many schools there must be the limit of time, the question is how can the study for the time be made most profitable? The writer's desire to help to an answer is his only excuse for giving his experience in directing "A Term's Work in English Literature."

ORDER OF STUDY IN NATURAL SCIENCE.

Professor R. S. BOSWORTH, of Watertown.

In the scientific department in most high schools and academies classes are taught in the elements of physiology, natural philosophy, chemistry, botany, zoölogy or natural history, geology and astronomy. If we may judge by the published courses of study of such institutions there is no well-defined or common order in which these branches shall be taken up, unless it be that physiology is usually first studied, in order doubtless that the pupil may early have the benefit of its hygienic rules, or may be he is first introduced to natural history with the hope that its wondrous experiments will fix his attention and excite to healthy action his dormant powers. No doubt the skillful teacher should encourage as well as he may even in the younger pupils habits of observation of all natural objects and phenomena, no matter to which of the great branches they properly belong; let him early begin his collection of minerals, botanical and entomological specimens, yet when the time comes to take some science as a regular study in the course, is it a matter of indifference with which he begins?

Suppose for instance physiology is the first one studied. At the very outset he is told, may be, of the composition of the bones and their lever-like function, but the terms calcic phosphate, gelatine, levers of the first, second and third order are sound without sense to him. Still more is he entangled in unknown technicalities when he comes to the subjects of food-digestion, respiration, circulation, and unless his text-book or teacher often pause to impart physical or more especially chemical science, his knowledge of physiology will like the weather in the almanac "clear off cloudy."

Not to multiply instances, how can the student in botany have any clear idea of the composition or structure of a plant without a knowledge of the chemistry of the earth, air and water upon which it feeds? How in physics can the generation of dynamic electricity be understood when the great laws of chemical action are unknown? And so in the study of every department of nature constant recurrence must be had to chemical action, its laws and terms.

Looking over the whole field of natural sciences, this broad field whose bounds are those of the universe, may we not truly say that chemistry underlies them all? And that it is the true basic science. If we then follow out the thoughts and considerations here so briefly hinted at, may we not conclude that the young student of nature, of the material world, should always begin his regular course with that science which treats of the elements or composition of all matter, of the atoms and their laws of action. Next in order, should he not take the action of masses upon each other, those great changes accompanied by sensible motion, motion and its laws, and those forms of energy known as heat, light and electricity. Thus armed with the great principles of chemistry and physics, he may make fair conquests in all other regions of nature's domain with but little regard perhaps for the order in which they shall be invaded, except that for obvious reasons geology should be the last.

UTILITY OF ZOOLOGICAL COLLECTIONS IN EDUCATION.

By Dr. WILLIAM A. CONKLIN, in charge of the Central Park Collections.

The ardent pursuit of natural science, eminently characteristic of our day, has made itself keenly felt in the domain of natural history.

For a long time it had been the fashion to regard living collections as mere material for the idle curiosity of gaping crowds, but a more healthy and truth-approaching sentiment has lately lifted our museums of natural history and zoological preserves into an effective and far-reaching medium for the instruction and moral culture of the masses. Who that has gazed upon the admirable panorama of animated nature in the "London Zoological Garden," or in the "Jardin des plantes," and has noted the close and intelligent attention bestowed upon the living representatives of the world's great household by even the most ordinary citizen of London or Paris can doubt that the scientifically classified list of animals there contained has exercised a strongly educational influence on the people. And the same may be said of Berlin, Frankfort and Hamburg.

Systematic knowledge is the basis of true science, and no matter in what department of human effort this supreme character of order may be exhibited there we may be sure to find cognate results.

The immensity of stellar space, brilliantly alight with the torches of the night, once offered to the untutored vision of the rustic dweller on the plains of Shinar naught but an inextricable network of glowing points, and yet, on the observation of these same luminous spots, was constructed that sublimest of science, astronomy. In like manner the infinite variety of animals that roamed the forest, swam the seas and clove the azure deep of heaven were so perplexing in their myriad differences to the first fond lover of animated nature that they despaired of bringing them within the bounds of the knowable. But kindly science came to the rescue of the puzzled inquirers, and thanks to the life-long labors of a Buffon, a Cuvier and a Linnæus, the tangled web of animal life has been unravelled, the intricate labyrinth of Nature's teeming store-house been trod, and, we may say, that the hope of erecting a solid and scientific superstructure for the science of zoölogy has been realized.

Knowledge underlies science; science gives it character and whatever knowledge is susceptible of a scientific character is precious beyond comparison, and more so in proportion to its abundance. Now, I maintain, that the facts of zoölogy are not only the object of knowledge, but that they surpass in number and variety the facts upon which most sciences are based. For this reason its claim to be viewed as a most important adjunct to popular education is held not only to be valid but intensely valuable. The book of Nature is ever before the eye; its lessons are not to be read by the slow method of artificial characters, but by that divine ichnography which is the stamp and alphabet of the Creator.

Poetry and philosophy have sunk their shaft deep into this inexhaustible mine, and what treasures have they not thence drawn forth! Aristotle and Virgil have alike worshiped at this particular shrine of Nature, and from what they have written, living under the restricted circumstances of their time, we may infer what a more appreciative and scientific knowledge may accomplish. A common adage runs, "*Populus vult decipi*," but a truer maxim would be this, "The people wish to be instructed." How this may be accomplished a few reflections will, I hope, point out, discursive and disconnected as they must necessarily be within the brief limits at my disposal.

It is an error to suppose that we cannot study the character and habits of the different members of the animal kingdom outside of their native state when enjoying the liberty of a wild life; that in captivity we can acquire no accurate notion in respect to them, since their actions are then restricted and modified by the new conditions of their life.

It was the opinion of Buffon that confinement impedes the exercise and development of all animal faculties. "The savage animal," he observes, "obeys only Nature and knows no other laws than those of necessity and freedom." This erroneous idea had its origin in the notion that captivity means slavery, whereas the truth is that the independence which a wild animal enjoys is by no means so complete as we would be led to infer from *our* ideas of a state of nature. Many and various influences modify the conditions of its life in freedom — the near or remote presence of man — abundance or scarcity of food — changes of temperature — the strength and courage of its rivals, and many other circumstances. It seems strange that Buffon should have entertained the opinion above expressed, when we consider that the collection of animals in the "Jardin des plantes" was so invaluable to him in the production of his history. To-day the very popularity of zoölogy has acted as a safeguard against the important mistakes that were made by those writers on natural history who considered animals as existing in their wild state. Relying for information upon the reports of travelers, previous writers represented to us the lion as endowed with every attribute of nobleness and clemency, while they pictured to us the tiger as fierce and untamable.

As illustrative of the value which a close inspection affords us in an artificial collection, I will state that modern zoölogy has established a complete identity of disposition between the specimens held in captivity and their congeners as studied in a purely feral state. Another fallacy which a closer acquaintance with animals in captivity has set aside is that relating to the belief existing among popular writers of natural history that the herbivora are of a mild and affectionate nature. From this many infer that the character of the alimentary substance upon which animals subsist is contributive to the development of a peculiarly moral tone, so that the tenderness and mild-eyed clemency of the antelope and the camel is the outcome of the juicy and unstimulating fodder they consume, while the

ferocity and cruelty of the lion and the tiger are the result of their fondness for gore.

This physiological supposition has also made its impress on poetry. We associate the soft and timid gazelle with mildness and beauty and affection, an idea more inspired by her fascination of appearance than by fact. The reality, however, disproves this charming and popular notion, for the dear gazelle of the poet is not the gentle, generous and confiding friend which his fancy painted it; nor is the tiger the treacherous ambuscader of the jungle without one redeeming feature to relieve his base and bloody instincts. How many delusions of this sort still find a lurking place in the popular bosom all nurtured there by ignorance and traditional misrepresentation? To combat and dissipate these erroneous views should be one of the main objects of the science of zoölogy, and in no manner can this desirable end be more effectually gained than by fostering and maintaining well-arranged living collections.

These are a few of the many instances which prove the importance of zoölogical collections as a means of obtaining a correct knowledge of the habits and characteristics of animals, as it shows that the reverse is true in these cases, for among the herbivora there is less attachment and more brutality than among the carnivora. The writer has had personal experience strongly tending to refute this widely accepted notion. A camel which he cared for and nursed when sick forgetting the duties of all mild-eyed and pathetic looking beasts nurtured on the fragrant product of the meadow, returned the kindness shown him by a fierce attack that resulted in a broken limb. This comparison between the nature of the herbivora and the carnivora indicates, as a rule, that gratitude, affection and gentleness accompany a higher intelligence among animals fed on more highly organized substances.

Then again it was for a long time supposed and is yet so by many that the intellectual powers of animals were in proportion to the perfection of their organs, those having the most delicate senses and most muscular limbs being considered as endowed with a clearer intelligence than those whose physical organization consigned them to a lower grade. At first sight the monkey and many carnivora seem to confirm this opinion. On examining the seal, however, the hypothesis was proved to be without scientific foundation. This animal of all the mammalia was from its structure supposed to be least gifted with intelligence. It has no external ears, it cannot see perfectly in the air, as its eyes are adapted for vision in the water, the thick blubber which covers its body deprives it of the sense of touch except where the whiskers are found, the nostrils are open only in the act of breathing, while its limbs are like oars or fins. In spite of all this the seal equals the dog in docility, instinct and power of attachment. It was due to observations feasible only under the conditions in which the seal is artificially preserved that these highly interesting conclusions could have been reached. As another instance of the importance of the study of animals in captivity, I

would mention the fact that whereas it was generally supposed that the lower animals while enjoying the untrammeled freedom of their natural state matured intellectually as they advanced in years, the contrary was found to be the case, for we know that they arrive at the highest state of mental development in early years, and are at that period of their lives much more intelligent than their aged parents. Here we have before our view one very important difference between man and creatures of a lower type of organization, the former being capable of indefinite improvement from youth upwards, his mind impelling him to aspire to a gradual perfectibility, the limits of which are commensurate only with the hopes of the race, while the dumb denizen of the field is destined to work within the limits of a naturally circumscribed activity.

The establishment of zoölogical gardens has also helped to throw a flood of most welcome light on the instinctive characters, habits and actions of those animals that have been kept under observation.

It was once generally believed that beavers built their dams only when living in the gregarious state, solitary individuals being supposed to seek habitation in natural cavities on river banks, etc. Here again, Buffon errs when he says that these animals are not urged to work and to build by that impelling instinct or physical necessity which guides the ant or the bee to take precautions against the vicissitudes of time, but they act *par choix*, that is from understanding the design and utility of their work, and that their industry ceases when the presence of man inspires them with a dread of his power. Now what happens when the animal is placed in an artificial habitation? If materials are at hand he will build, not because the necessity exists, but because his instinct urges him to do so.

From these hastily collected facts and reflections, imperfectly presented as they are, I would that the members of this learned convocation might infer the necessity of our great Commonwealth's being alive to the necessity of holding aloft the torch of scientific light in this as she has done in other departments of human inquiries, and that as history, philosophy, literature and art have sought and found a shelter beneath the ægis of her intellectual men, so the almost nascent organization of zoölogical collections will be the recipient of her munificent protection.

A reference to the work accomplished in the countries of Europe and some of our own States will not, I feel confident, fail to give point and weight to this expression of a long and deeply entertained hope.

Collections of animals were made in very ancient times. At first their aid was sought in agricultural labor and in waging war. They were venerated in the temples and sacrificed on the altars. In the amphitheaters they were actors in sanguinary fights, and their claws and fangs were often stained by the blood of martyrs.

Alexander, amid the fatigues and excitements of conquest, never losing an opportunity to further intellectual progress, sent to Aristotle all the rare animals he found in foreign countries. This was

the origin of the first zoölogical collection, the source whence Aristotle obtained the material for his great work on zoölogy, "History of Animals."

Ancient Rome, notwithstanding the high scientific culture of her citizens, made large collections of wild animals only to whet the brutal appetites of the populace by the bloody fights of the arena, and thought not that the Nubian lion and the tiger of the east were destined to play an important role in the intellectual improvement of our race.

In the time of the late Cæsars a few private collections were made, and to his observations of them Pliny owes the inspiration which gave the world his celebrated work on natural history. Although full of errors, it served as a text-book to naturalists up to and during the middle ages. So far no properly organized collection existed. The best was made in 1640 by Louis XIII at Versailles, known as the "Jardin du Roi," from which was organized later the "Jardin des plantes." Buffon was appointed director. He had resolved previously to devote himself to the pursuit of science. This appointment called his attention more pointedly to natural history and he determined to continue the work of Aristotle and Pliny by describing the organic forms of nature on our globe, and was the first since their time to devote intelligent attention to the subject. His example was followed by Cuvier and St. Hilaire, who laid the foundation of true science in these lines of investigation. The former owes his determination to make natural history a life study to an attentive perusal of Buffon's work. Thus all the great results achieved in this field had their origin in the Zoölogical Garden of Louis XIII.

Frederic Cuvier, brother of the great naturalist, wrote while in charge of that department in the garden, the "Natural History of Mammals," describing, in a charming and elegant style, more than five hundred animals, and illustrated their habits and intelligence by many and most interesting anecdotes.

Who would not to-day, in the light which our increased facilities for observation afford, smile at the puerility of a Descartes and a Buffon in denying all intelligence to the lower order of animals, whilst that same large light brings into clearer prominence the absurdity of Condillac and George Leroy, who accorded to them even the highest intellectual capacity and thus confounded instinct with reason?

Frederic Cuvier drew the line between the intelligence of different orders, tracing it from the lowest rodents through ruminants, pachyderms and carnivora to the quadrumana. He first showed that domesticity in animals depends on their sociability, being not a change but a development of their natural condition. Man found animals living in society, and he made them domestic. We may tame the solitary and fierce bear, lion and tiger, but we cannot domesticate them.

Thoroughly imbued with the value of living collections and their

unbounded influence on the education of the people, the London Zoölogical Society and the Acclimatization Society of Paris bent their best energies to form a complete and systematic organization of zoölogical groups wherein all specimens might be represented. The latter, established in 1854, not only issues publications, but gives prizes in the shape of medals and money for the best works relating to zoölogy and the best methods of breeding, alimentation, etc. The former, organized by royal charter in 1829, originated in a collection made by Henry I. at Woodstock. It contains one of the finest zoölogical libraries in Europe. All the foreign English representatives, princes and travelers take interest in the garden, sending to it, or aiding others to do so, many rare specimens from the different countries of the world. They issue yearly volumes of transactions and proceedings wherein are contained exhaustive accounts of the actual condition of the collections and the most recent researches that have been made. To these volumes such illustrious naturalists as Huxley, Mivart, Sclater and Flower are frequent and free contributors. In addition to the gardens already mentioned, there are twenty-two others in different parts of the world. The Antwerp garden is noted for the breeding of foreign birds, parrakeets, etc. The Berlin, Frankfort and Cologne gardens have an immense collection housed in magnificent buildings, while in this country the cities of Philadelphia, Cincinnati and St. Louis have already established fine zoölogical gardens.

Why should not the Empire State — so marvelous in growth, so rich in resources — emulate, I will not say the old capitals of Europe, but her smaller sister States at home, in a laudable effort to found a well-organized and scientific collection of living specimens, whereby her citizens may be trained and educated in a most interesting and instructive branch of knowledge and her reputation for culture may be strengthened and diffused.

Our present collections at the Central Park are meagre, ill-equipped and badly provided for. We need a strong and wide-spread sentiment to support what we have and to insure a swift increment and sturdy growth.

If ever a theoretical knowledge of natural history entered into the curriculum of our public schools this want would make itself more surely and more speedily felt, and not only would a demand be made for increased facilities for practical knowledge and observation, but public-spirited citizens would willingly open their purses to the demand.

But for one reason or another the chief and most instructive feature of zoölogy now languishes, and living collections in our midst are almost a fiction and a myth. So far has apathy in this direction gone that the very hand-books of zoölogy that circulate in our schools are replete with errors and complacently repeat the polished fallacies of Goldsmith.

On the Legislature of this State the important work devolves of lifting this branch of natural history out of the ruts, and I feel con-

fident that the members of a body so conspicuous for their zeal in the interests of higher education will not hesitate to lend their noble efforts to the promotion of this much needed purpose; for, on considering the subject from all possible points of view, we must necessarily conclude that the examinations of animals in zoölogical collections is the best method for acquiring a correct knowledge of them, and that the zoölogical garden is the place where the lover of Nature can best pursue his scientific investigations in natural history and study, to the best advantage, the different members of the animal kingdom.

Professor MARTIN, of New York — Mr. President — I want to say a word. I feel great sympathy with discussions of this kind. All collections of that kind are the best modes of teaching — through the senses, and these are the first and earliest modes. A child learns through the senses. When he cannot take a book, or cannot read, or make investigations in another way, he can learn in this way and every thing that facilitates — every thing by which he can learn — forms a basis for a greater information, and so greatly advances education, and the improved modes of education. I have no doubt we shall have far more extensive methods of instruction of that kind, and we shall derive a great deal of time for subsequent and advanced study which is now lost in imperfect methods of that kind of study in our earlier years, to avoid the errors we have heretofore shared as regard the habits and dispositions of animals in connection with the different kinds of food. I recollect that interesting discussion of Herbert Spencer, in which he endeavors to advocate a change in the mode of education or physical treatment of children. It has been published and circulated very widely. Mr. Spencer maintains, for instance, that the tendency to activity is a thing that depends upon the higher organization of the food that animals use. For instance, the cow has to eat a quality of food very innutritious and, of course, has to eat a great deal of it to get any nourishment, and becomes a slow, heavy animal. The horse, on the other hand, eats grain, a more highly organized kind of food, and consequently is a more spirited, active animal. Perhaps if Mr. Spencer had confined himself in a twenty acre lot with an enraged bull, he would find that the cow had plenty of activity. He would want cattle of that kind to be slow under these circumstances, and yet on that ground Mr. Spencer advocates an entire reversal of the ordinary modes of feeding children, claiming that a great deal more meat-food of a higher organization would render them more active. And some of the most important physical suggestions that have been offered by very high authority have been based upon reasons just as crude and just as valueless as that to which I have referred of Mr. Spencer. Let me make use of a little verbal criticism. The author says: "Certain animals play certain roles." We say in English: "To play a part." I do not know why our English, our good old speaking English should give way to new ones of that kind which is no advantage whatever, which only colors our English style. I will take the

liberty to criticise the preceding paper in regard to the study of English literature. It was an admirable paper and was well worth the attention of professors and teachers. He said: "It goes without saying" that certain things are so and so. I hope we shall not in this convocation depart from the established usages of our English tongue in any of those admirable models of English style.

Professor WILLIAMS, of Cornell University — Mr. Chancellor — If I may be permitted, I wish to add a word of confirmation to the statements in Dr. Conklin's papers with regard to collections, from my own observation of the value of collections as teachers. It happened about four years ago — I was in Paris. My visit led me to the vicinity of the Jardin des plantes, and I was enabled to pass by the zoölogical garden every day, and there standing in the mud it was usual to see a large collection of people of the middle class clustered around these dens of animals in the garden. It gave me very great surprise, for very often I found the animals I went to see were almost inaccessible from those crowds of eager, intelligent observers of what they were doing. I learned many things during those visits. While there I noticed one of the lions, into whose den a little dog had been thrown, and the little animal had made a fight and had shown what little power it could in its efforts at self-preservation, and the lion had shown something of that magnanimity of which we read in the relation of the lion and dog in the prison and had adopted the little fellow who now ran around at the lion's heels. There were the great beast and the little dog living happily together. And there was a great log of a tree over which the lion would bound, and it was a very curious thing to myself, as well as to those people of Paris, to see the great creature play with the dog after the very manner of our domestic pussy with a ball of yarn. All these things were observed with great care by the people of Paris. The educational value of this collection to them is one not in danger of being overestimated.

APPARATUS SUITABLE FOR TEACHING PHYSICAL AND NATURAL SCIENCES IN ACADEMIES.

By Professor LE ROY C. COOLEY, of Vassar College.

The physical and natural sciences hold a much larger place than they formerly did in the academic course of study. But it is still sometimes asked whether the educational value of the sciences entitles them to such high position. It cannot be denied that, whatever may be true in the abstract, the actual results of science teaching in the academies are often educationally inferior to those attained in the departments of mathematics, language and philosophy.

It is said that such inferior results are due to a faulty method of using science. The complaint is that the study of science too often receives no help from nature, being made dependent wholly upon books, and that great stress is laid upon the so-called "useful facts" of science, while the methods by which facts have been discovered and the logic by which they are made useful are neglected. It is claimed that while the object of science in education is partly and ultimately to impart useful knowledge, it is chiefly and immediately to secure a training in thinking — the ability to discover facts, to judge their relations to one another and to turn them to practical use. And it is further claimed that, to attain these results, the study of science must be, not the study of books alone, but of nature — that the only true method is that which requires the actual presence of the plant in the study of botany, of the animal in the study of zoölogy, and of the experimental phenomena in the study of physics and chemistry. Hence, in our opinion, every academy ought to be supplied with a certain amount of apparatus and material necessary for the teaching of science by observation and experiment.

But in the selection of apparatus it requires a large experience to enable one to know what pieces, among the multitude of articles described in the voluminous catalogues, are really valuable for the purposes of the school-room. What apparatus should be bought, where can it be obtained and at what probable cost — these are questions which are often very perplexing and on which accordingly it is the purpose of the *Board of Regents* to offer some suggestions. We will suppose that an academy is just beginning and that the funds are limited to the amount ($500) named by the Regents as the value of the apparatus and collections which an academy must possess. Then first in a general way we say:

Buy principal pieces first and accessories afterward. There are certain pieces among the apparatus for every branch of science which are of fundamental importance. For example, some means to produce a vacuum lies at the bottom of all experimental study of the physics of gases, while without a battery to generate the current, all other articles by which the phenomena of dynamic electricity may be shown are useless. The air-pump is a principal piece of pneumatic

apparatus about which many others cluster, and the battery is likewise a principal piece on which most of the other pieces of electrical apparatus depend. Let these pieces be purchased and of good quality even when the funds at command will not permit the addition of a large number of accessories. Remember also that the accessory pieces are sometimes so easily constructed that only the materials for them need be bought, and that even these materials are often to be found in the nearest household or shop, so that their cost is nominal. It is wise, therefore, to select first some really valuable form of each one of these principal pieces in each department, and then to add the accessories as far as the remaining funds will go, trusting to the future for a symmetrical growth of the cabinet.

Another general principle is also a useful guide in the purchase of apparatus:

From among the efficient forms of any piece select the simplest. The first question about any piece of apparatus should be: Does it perfectly do the duty for which it is intended? A microscope, for example, which yields an illy defined image ought never to be purchased at any price. Are the lenses so good that the image is well made? Only on this condition should the instrument be purchased. Then the second question should be: Is the instrument constructed on the simplest plan consistent with good work? The simplest apparatus which will exhibit a phenomenon clearly is always the best. Instruments are sometimes so imposing in size or beautiful in ornamentation, or complex in structure that they are unfit for use. A piece of apparatus which attracts attention to its own form or beauty instead of fixing it upon the phenomena, which it is designed to exhibit, is out of place in the class-room. Multiplication of parts and high finish add largely to the cost of apparatus and subtract largely from its educational value. Neatness and simplicity are cheaper and in the highest degree desirable.

It may be added in regard to where apparatus may be found, that it will be wise for buyers, especially inexperienced buyers, to deal directly with old, well-established and reliable firms. Several such are in the city of New York and others are in Boston and Philadelphia, which are widely known and recognized by scientific men as eminently qualified to supply the best of every thing. These dealers publish descriptive catalogues and price lists which they will furnish on application, and any one of them will cheerfully give estimates on any list of supplies which you contemplate buying.

And then there are facilities for obtaining apparatus from abroad. For that which is to be described in this paper there is almost no inducement to do this. But if your purchases are to cover a wider range it is quite possible that you may want articles which are furnished more cheaply by foreign manufacturers, or of newer if not of better designs. Now the law permits the importation of apparatus for all schools and colleges *free from duty*. This brings apparatus of foreign make within your reach at very slight advance on foreign prices. And, what is more, these firms, just referred to, are ready to

make the importation for you at prices named in foreign price lists with the cost of transportation added.

Having made these suggestions of a general character we now set out to give definite information which will help the buyer of apparatus to furnish his academy with the best outfit to be had for the money he has to expend. We will name the pieces required in each department in order that all together may form a symmetrical working cabinet. We will also state the prices of these articles and give such hints in regard to their best forms as may seem to us would be helpful to one who is to make selections.

In making this list we have consulted the catalogues of dealers in New York, Boston and Philadelphia, and the prices stated are *actual list prices* found in one or another. They are the *present* prices which may be subject to future changes. Moreover they are the *list* prices from which many of the largest dealers make discounts. Before giving an order it will be advisable to ascertain what is the custom of the firm in this respect.

Catalogues of the following houses have been consulted:

Eimer & Amend, Chemical Apparatus, 205 Third avenue, N. Y.

Richards & Co., Chemical Apparatus, 398 Bowery, N. Y.

Jas. W. Queen & Co., Physical Apparatus, Philadelphia.

E. S. Ritchie & Sons, Physical Apparatus, Boston.

L. G. Tillotson, Electrical Supplies, 5 and 7 Dey street, N. Y

Bausch & Lamb, Optical Co., Miscroscopes, etc., 37 Maiden lane, New York.

J. & H. Berge, Chemical and Physical Apparatus, 191 Greenwich street, N. Y.

E. B. Benjamin, Chemical and Physical Apparatus, 10 Barclay street, N. Y.

W. J. Rohrbeck, Chemical and Physical Apparatus, 42 Bond street, New York.

PHYSICS.

The supply of apparatus needed in physics is larger and more costly than in any other department of science. It will require a careful selection of principal pieces, a heroic prudence in naming the accessories and a somewhat lavish supply of material to be worked up into extemporized forms as occasion requires, in order to bring any satisfactory collection within the limits of value which we have supposed.

In what follows, the several branches of the science will be considered in detail. The order in which they succeed one another in this list is unimportant.

1. *Pneumatics.*

An air-pump, a barometer and a Boyle's law apparatus are the principal pieces here.

Select a modern, low-mounted, single barrel lever pump. It will be light, easily operated and capable of producing a good vacuum.

Various sizes are made. For all the work of an academy, a pump with a barrel 8x2 inches and a plate nine inches in diameter, is a very convenient size. It should be provided with a mercury gauge to indicate the degree of exhaustion. This gauge, moreover, is in itself an instructive pneumatic instrument.

Air-pump, cyl. 8x2 in., plate 9 in. with lever and gauge.... $40 00

The barometer should be of standard excellence. The cheap forms, such as the wheel barometer and the aneroid, have little scientific value. It is better to pay the price of a really good style of this important instrument. Such are the barometers made by J. & H. J. Green of New York, and known as the Smithsonian standard barometers.

Barometers, Smithsonian, reading to $\frac{1}{100}$ in..... $35 00

A really satisfactory Boyle's law apparatus is rather difficult to find. The old form, with stationary bent tube and fixed scales, in which mercury is to be added for each experiment, is not quite convenient, and unless used with great care, yields results which only approximate accuracy and sometimes not very closely. Better forms are in use in some laboratories, but unfortunately they are not to be found described in the catalogues. As arranged by Cooley, the mercury remains unchanged in quantity throughout all the experiments; an adjustable scale gives quick and exact readings, and the same instrument serves for pressures both greater and less than an atmosphere. If in any case you can find a piece possessing these characters, choose it. The usual form consists of two pieces; one for pressures more than one atmosphere, the other for pressures less. Both are necessary for demonstration. But then the latter can be extemporized without great difficulty, and hence where economy is imperative, only the former need be bought. It is described as

Marriotte's law apparatus, glass tube, mounted $9 00

The two instruments will, together, cost fifteen dollars. In addition to these principal pieces, there will be needed

1 plain bell jar, well-ground rim, 1 gallon..... $1 50

This will serve to cover any object which is to be submitted to the influence of a vacuum. A smaller bell glass (one quart) is usually furnished with the air pump without extra charge.

1 hollow copper or glass globe, stop-cock and hook $3 00

By means of this globe the weight of air and other gases is to be demonstrated. The stop-cock should be fitted to screw into the top of the air pump plate, while by the hook it may be suspended on the balance.

1 pair of Magdeburgh hemispheres, 4 inch, iron..... $5 50
1 fountain in vacuo, 20 inch..... 5 00

These two pieces give definite and attractive exhibitions of atmospheric pressure.

1 radiometer of Crookes..... $6 00

This modern instrument is very desirable. It is the only one within reach by which any of the phenomena of high vacua can be shown, and the only one which bears directly upon the molecular theory of gases which ought not to be wholly neglected even in an elementary course.

Besides these pieces there should be a supply of glass and rubber tubing, of corks also, and bottles, but these will be described among the chemical supplies to which they are more closely related. They will be useful for getting up *ex tempore* experiments. For example, take a piece of glass tubing, a little more than thirty inches long, and close one end by melting it in a gas flame; an excellent barometer tube is thus obtained at one-tenth the price named in the catalogues.

2. *Liquids.*

Among the phenomena of liquids, those of pressure, the principle of Archimedes and the methods of finding specific gravities, are those for which experimental demonstrations are most urgent. Many of the experiments illustrating pressure, mentioned in the books, are of simple character, for which pieces selected from the list of chemical glassware and others will be easily arranged. Not so with the principle in regard to the "pressure on the base of the containing vessel." For this a special apparatus must be provided. The dealers furnish what are catalogued as

Pascal's vases..... $15 00

But for convenience and accuracy a Haldat's apparatus is to be much preferred. Judging from the catalogues this piece of apparatus is not generally kept in stock. All the large houses are, however, prepared to construct pieces to order and the Haldat's can be obtained in this way. If so, its cost will not be likely to differ much from that of the vases. You will find a description and cut from which this instrument can be reproduced in Ganot's Physics (ed. of 1877), page 81; also, but not quite so complete in the representation of its supports, in Cooley's New Physics, page 31.

Archimedes' Principle, brass..... $3 25

This piece will be used in connection with the specific gravity balance.

Specific gravity balance..... $20 00

It is well to have a *good* balance for the determination of specific gravity. In the best form, contemplated by the price above, one pan carries a hook on its under side and is suspended considerably above the level of the other. Mohr's and Queen's are of this style. A

set of metric weights, to be mentioned in the chemical list, will be used here.

1 pair of Beaume's hydrometers..... $2 00

A hydrometer jar, for the immersion of these instruments, will be found among the glassware of the chemical apparatus.

3. *Electricity.*

In this department we find the greatest disproportion between what one may desire to have and what he can buy with a fair proportion of the money contemplated in this list for physics. Recent discoveries have added largely to the points which seem to need demonstration; the phenomena throughout afford the most abundant and attractive experiments while the catalogues contain the most bewildering variety of instruments for the purpose. What then can be done with a few dollars to meet the wants of the class-room?

Well, in the first place it should be remembered that the late discoveries have not rendered the long known fundamental principles of the science obsolete; they have rather brought some of them into distinctive prominence. These should receive attention, whatever else is to be neglected.

Then the modern methods of treating electricity as a *measurable quantity* are also of supreme importance. They constitute the most marked distinction between the new science and the old. And as to the applications of electricity, these for the most part are perfected only by means of these new and exact methods. Some means to teach them must not be overlooked even if our resources are small.

And finally the applications themselves — these ought also, to some extent, to find representative pieces in the cabinet for teaching electricity. Guided by these principles, we proceed to select our apparatus:

1 bar magnet..... $0 50
1 horseshoe magnet..... 1 25
1 magnetic needle on stand..... 2 00
1 Holtz electrical machine..... 25 00

This last-named instrument is for the generation of static electricity, and is to be preferred to the old-fashioned frictional machine, on account of the greater vigor of its action. The one whose price is given here is described as having all the latest improvements and competent to give a spark from five to six inches long. A much larger plate machine would be required to do this.

It is well known that experiments in this part of electricity do not succeed in a damp atmosphere. The Holtz is even more subject to the influence of dampness than the frictional machine. Nevertheless without a dry atmosphere all other pieces as well work badly, and with an atmosphere reasonably free from moisture it will not be difficult to start the Holtz.

The latest so-called improvement in the Holtz machine is to make

it self-charging. The variety known as the Toepler-Holtz is the most popular of these self-chargers. It does away with the necessity for cat skin and vulcanite, which is a great advantage; and if you can get for twenty-five dollars a Toepler which will yield *freely* sparks as long as those named above, or even of *four* inches in length, you will be wise to choose it. Some positive assurance from the seller should be obtained on this point, for it is not best to sacrifice too much of the power of the machine in order to have it self-charging.

An apparatus to elucidate the principle of static induction stands next to the electrical machine in importance.

2 induction cylinders, brass..... $10 00

Excellent substitutes for these cylinders may be made at a much less cost. Two wooden cylinders seven or eight inches long and one and a half inches in diameter, with rounded ends, can be turned out very smoothly by any one who uses a lathe. These can be covered with good tin foil completely and smoothly, and then mounted upon glass rods with a base also neatly turned if desired. Such cylinders look neat and work well, and if you apply the tin foil yourself cost very little.

2 leyden jars, half gallon.....	$4 00
1 discharger, plain.....	2 25
1 dozen pith balls	25
1 book gold leaf	30

Brown paper, tissue paper, silk thread, lamp chimney of the long cylindrical shape, stick of sealing wax, glass tubing, window glass, bottles, wire, and some similarly common materials, will so supplement the list of apparatus just given that a very efficient course of experiments in frictional electricity can be given.

For example, a pith ball hung by a silk fibre from the upper end of a glass tube which has been bent over in a gas flame, and the lower end of which is fixed in a wooden block, constitutes a pith ball electroscope, just as useful as the boughten article would be. Or if you need a gold leaf electrometer, and you do, take two narrow strips of gold leaf and fasten them to the lower end of a large wire so that they will hang freely side by side. Thrust the wire through the cork of a tolerably wide bodied bottle or flask, and bend the outer end into a ring. Insert the leaves into the bottle or flask, which should be thoroughly dried, so that they shall hang in the center. This instrument will do as well for practical purposes as the plain gold leaf electrometer for which you would be charged four dollars.

When we reach current electricity our first principal piece must be the battery. At this point it should be remembered that no one form of battery will give the best current for all kinds of work. Indeed, a little variety here is quite desirable. For example, in electrical measurements great constancy of current is more important than great strength, while for the production of heat and light, great electro motive force is more important than perfect constancy.

2 cells gravity battery, W. U. Standard No. 3..... $2 40
4 cells Bunsen's battery, qt..... 6 00

The gravity battery is a convenient form of battery for constancy of current and for general use where a weak current is good enough. It is easily managed, working better if kept on a closed circuit. But for many purposes a strong current is needed. For these, on the whole, considering its electro-motive force, its constancy and its cheapness, when compared with the Grenet or Bichromate, which might be chosen in preference on account of its greater convenience, the Bunsen is to be preferred. Four cells will give some considerable range of resistance, according as they are linked in series or otherwise, and be quite sufficient for the academic course, except for the production of the electric light, which must be omitted where the funds will not warrant the purchase of a much larger number of cells. It is, however, only of the *arc* electric light that this is true ; an

Incandescent electric lamp..... $4 50

is sold by Queen & Co., which is lighted by three quart cells.

1 plain detector galvanometer $5 00
1 Helix on stand 3 00
1 electro-magnet, 3 inches..... 1 50

These pieces, with the battery, cover the fundamental principles of electro-magnetism. The most important application of this principle, viz., in telegraphy, ought also to be exemplified. The following will do the work:

No. 2 pony sounder..... $3 75
Plain signal key..... 1 50

The production and the effects of the induced current ought also to be exhibited, even when economy is imperative.

1 Ruhmkorff coil, ½-inch spark..... ..... $12 00 to $15 00

A coil giving sparks freely one-half inch will show the principle very clearly, and such instrument is useful on many occasions even in a well-equipped laboratory where a large and costly instrument can also be afforded for the production of fine effects. It will light up the smaller and medium-sized Geisler tubes beautifully and thus illustrate electricity in vacua. The luxury of a few of these tubes should be indulged in.

1 plain tube, 6 to 8 inches long..... $0 75
1 Uranium glass, 6 to 8 inches..... 1 00
1 double tube, Uranium bulbs with Fluorescent liquid..... 2 00

Unless bound by motives of economy, one would prefer to get tubes of twice the length indicated, but these small ones are really very beautiful and instructive.

For a few of the fundamental principles of electric measurements there will be needed the gravity battery and the galvanometer

already described, and, in addition, some coils of wire. But it is better to buy the wire and make the coil when required.

1 lb. copper wire, No. 18, cotton covered	$0 60
1 lb. copper wire, No. 16, cotton covered	50
1 spool (1 oz.) copper wire, No. 30, silk covered	75
50 ft. German silver wire, No. 30, silk covered	50

The No. 18 copper wire will be needed for battery connections. From the others make four coils.

Let 50 feet German silver, No. 30, be placed in one spool.
Let 50 feet copper, No. 30, be placed in another.
Let 100 feet copper, No. 30, be placed in a third.
Let 100 feet copper, No. 16, be placed in a fourth.

By this means you have two wires, which differ only in material, two differing only in length and two differing only in size. Good illustrations of the laws of resistance can be given by this set.

Wind just 9.8 feet of No. 30 copper wire on a fifth spool. The resistance of this will be one ohm. Two other coils, each 19.6 feet or two ohms, and a fourth containing forty-nine feet, would constitute a set by which resistances from one ohm to ten ohms would be represented.

4. *Heat.*

To illustrate the fundamental principles of heat very little special apparatus need be bought. Flasks, beakers and some other utensils will be found among the chemical apparatus, and many other useful things among materials which are common everywhere.

The *conductivity* of solids can, for example, be illustrated successfully by means of wires of copper and iron, with a little wax as an indicator and a lamp flame for heat. The poor conductivity of liquids can be shown with a test tube with water and a bit of ice. The *expansion* of a gas can be readily exhibited by means of a small bottle through whose tightly fitting cork a tube of glass a few inches in length projects. While if the bottle and a little of the tube be filled with water, it becomes an instrument for showing the expansion of a liquid, which it will do by simply standing the bottle in a dish of hot water.

1 thermometer, F, 212°	$1 50
1 thermometer, C, 200°	2 00
1 ball and ring	1 75
2 air thermometer bulbs	50

5. *Sound and Light.*

Experimental demonstrations in sound and light are among the most easy, attractive and valuable in physics. Modern and cheap sets of apparatus are just here especially desirable. Such are the sets which have been devised by Prof. Alfred M. Mayer, of the Stevens Institute. They demonstrate the most important principles

in these branches in a very scientific way; have this advantage which many academic teachers will appreciate, viz., that each set and the *experiments to be made* with the several pieces are clearly described in two small volumes entitled respectively "Sound" and "Light." These books are published by the Appletons, New York, and are sold at one dollar each. These sets are made under the direction of Prof. Mayer, by Mr. S. Hawkridge, from whom the pieces can be obtained in sets or separately. We append a list containing the most important pieces:

Heliostat, brass mounting, usual form	$15 00
Water lantern	5 00
Refraction bottle	15
Lens, plain convex, 3 inches	75
Lens, double convex, 3 inches	15
Lens concave	75
Prism	50
Mirror, concave, 6 inches	2 50
Blackburn's pendulum	2 50
Return ball and fine wire	05
Slips of wood and board	25
Pair of pine rods	25
Two pine rods with mirrors	30
One C fork	70
Two A forks mounted on resonant boxes	2 55
Brass disk for Chladni figures	1 00
Two resonant bottles with glass plates	15
Organ pipe A	75
Geyer sensitive flame	1 00
Long brass spring-cord and resonant box	1 50
Rotator with 4 disks—Siren, Crova's, Rood's and Mayer's.	4 50
Disk punch	50
Resonant glass tube, 1 foot by $\frac{3}{4}$ inch	05
Singing whistle and 3 feet of tube	60
Sonometer	2 50
Violin bow	50
Konig's vibrating flame	2 50

The entire "sets" contain a few articles not here enumerated, and a few pieces are named here which are not in the sets. These substitutions will be readily made by the seller.

The heliostat and the lantern require sunlight, without which they will be useless. But sunlight can be obtained in any room which has an eastern, a southern or a western exposure, and the experiments are so desirable that some effort should be made to secure a window facing in one of these directions.

MISCELLANEOUS.

Metric Measures.— In addition to the metric weights and measures of capacity recommended in the chemical list, one or two other

articles may be mentioned which are very useful in teaching this important subject:

One chart of the metric system..... $2 00
One metre and yard, metal tips..... 1 75

For Adhesion.— A glass disk and cord (75 cents) and a set of capillary tubes, six in a wooden frame with a water pan ($1.25), are all you need to buy. Capillary plates are easily made of strips of common glass.

For Rotary Motion.— A "whirling machine," which, with its set of accessories, can be bought for $11, will do good service.

Pumps.—Models of the pumps, lifting and forcing, can be had for four dollars. They are made wholly of glass and hence exhibit the action clearly. These also are desirable.

CHEMISTRY.

The method to be pursued in teaching chemistry will largely control the selection of the apparatus. If the "laboratory method" is adopted, apparatus will need to be furnished to the working tables of the students; if the class-room method, then only to the shelves of the cabinet. For the first the pieces must be much more numerous than for the last; they may be of smaller size, often of a different kind, and will be arranged in sets.

In making up such sets, bottles, fruit jars, goblets and other inexpensive articles can be substituted for the more costly pieces supplied by the dealers in chemical wares, and as shown in the appended paper on "Science Teaching in Academies," a few such sets, costing less than five dollars each, would enable the members of a class to pursue a very respectable course in chemical experiment.

But in what follows we will suppose that the apparatus is to be used by the teacher. The cost of an apparatus suited to his wants may depend much upon his tastes, because there is so great a variety of forms differing in the size and finish of the articles. But a good working apparatus, able to cover the demonstrations in general chemistry in the academic course, may be obtained for about $100, and we will set out with this limit in view.

In physics, each branch of the science must be furnished with its own set of apparatus, and the pieces in one seldom find an application in any other. This is not true in chemistry. Here the same pieces are to be used over and over again, as the same processes recur from time to time. An apparatus, therefore, which will cover the *general processes* in chemistry, will meet the requirements of all the special cases. Let us group the pieces under the several operations for which they are needed.

1. *The Preparation of Gases.*

For the preparation of those gases which will be given off without the application of heat, you will need:

Gas bottles. — Common wide-mouth bottles will serve the purpose very well, but the article sold under the above name is of better quality, more graceful in form and not too expensive.

Funnel tubes. — The variety known as "Thistle tubes" has the best shape. They should be from fifteen to eighteen inches long. One may be plain, a second may be bent with one bulb, while a third may be of the style known as "Vogel's." This last is a very convenient tube; it combines in one piece a funnel and delivery tube, and requires only one hole through the cork of the bottle.

Delivery tubes. — These are to be made when needed, by cutting plain glass tubing and bending into shape. Tubing for this purpose may have an internal diameter one-eighth to three-sixteenths inch, and should not be too thin; glass of medium thickness will bend with less trouble.

Corks. — Corks will be in constant demand elsewhere as well as in the preparation of gases. They should be of the finest quality and in a variety of sizes. The most useful are those whose diameter (small end) is from one-half inch to one inch. They are sold by the gross and its fractions. A quarter gross of each size included between the limits named will be a good supply.

Rubber stoppers.— For gas generators these are far superior to the corks, making tighter joints and being more durable. They are furnished already pierced with either one or two holes, as may be desired for the insertion of a delivery tube alone, or with the funnel tube, where both are needed. They should be of such size as to fit the bottles or flasks for which they are intended, and the dealer who furnishes the bottles will select the small number required if asked to do so. They will cost about twenty-five cents an ounce.

Flasks. — In case the preparation of the gas requires heat, you will need to use a flask instead of a bottle in which to generate it. The glass should be of the best, uniformly thin and well annealed. For oxygen a *copper* flask is desirable, although its preparation may with care be conducted in glass, if only a very small quantity is sought. An oxygen flask, designed by Prof. S. A. Latimore, is cheap and good.

Supports. — Get a good retort stand for this purpose. Let it be of iron, and select one which carries at least three rings. The newer style in which the rings can be taken out from the side is the one to choose.

We append the following price-list of these pieces:

3 gas bottles, 16 oz.	$1 10
1 funnel tube, plain	25
1 funnel tube, 1 bulb	30
1 funnel tube, Vogel's	50
1 lb. glass tubing, best Bohemian, $\frac{1}{8}$ — $\frac{3}{16}$	60
Corks, finest quality, sizes $\frac{1}{2}$ inch to 1 inch, small end, $\frac{1}{4}$ gross each	1 00
$\frac{1}{2}$ doz. flat bottom flasks, 8 oz	1 00
$\frac{1}{2}$ doz. round bottom flasks, 8 oz	1 25

½ doz. flat bottom flasks, 16 oz	$ 50
Oxygen flask, copper, S. A. Latimore's	1 50
Iron retort stand, 3 rings, new style	1 00

2. *The Collection of Gases.*

For collecting gases the apparatus will consist of a pneumatic cistern and a set of gas receivers. Pneumatic cisterns can be had in glass or metals. Size for size the glass will cost more money, and we will, therefore, recommend the metal. Such a cistern must of course be kept free from acids, but with proper care it will last a long time. It may be described as follows:

Pneumatic trough, Japanned metal, 12x12x16	$4 50

Cisterns serving the purposes well may be extemporized at little cost, by hanging a shelf a few inches below the top of a large wooden pail or small tub.

To receive the gases and to store them for use the following pieces constitute a good outfit:

3 bell glasses, tall, knob top, ½ gal	$3 00
2 bell glasses, tall, knob top, 1 pint	1 00
2 bell glasses, tall, stoppered, ½ gal	2 50
2 specie jars, ½ gal	60
1 rubber gas bag, with fittings, 3 gals	3 50
1 mercury trough, porcelain	1 00

Wide mouth bottles and fruit jars are cheap but convenient and respectable substitutes for the bell glasses and specie jars.

3. *Washing and Drying Gases.*

The Woulff's bottle stands among the most widely known and effective forms of washing apparatus. Among other devices, perhaps Silliman's may be recommended. It is desirable to have both, and a good set will be found in

3 Woulff's bottles, 3 necks, ½ pint	$1 65
1 Woulff's bottle, 2 necks, 1 quart	90
1 wash bottle, according to Silliman	75

Good substitutes for these are easily made from common wide-mouth bottles, fitted with tight corks through which the proper tubes are inserted. When this is contemplated, you cannot do better than to purchase "Vogel's Wash-bottle Tubes" at fifty cents each. One of these being inserted through the cork, converts an ordinary bottle into a good two-necked washing bottle.

For drying gases the material employed may be either concentrated sulphuric acid or calcium chloride. For the first of these a small wash bottle may be used, but for the second of these substances there may be supplied:

½ dozen calcium chloride tubes, 6 inch	$0 72
1 calcium chloride jar, 10 inch	85

4. *Production and Application of Heat.*

Common house gas is the most convenient and efficient fuel for the lecture or the laboratory table; only in its absence can one be contented with alcohol. The lamps needed may be prescribed as follows:

1 Bunsen's gas burner, with air regulator	$0 85
1 flat top for same, for glass working	25
1 small alcohol lamp	50

These will supply heat for all ordinary purposes. But for purposes where very high temperatures are needed, such as crucible operations, a blast lamp will be required. To furnish the air blast for it some kind of a bellows must be provided. Of these the most excellent forms are:

Bunsen's blast lamp	$5 00
Fletcher's foot-blower, No. 9, new pattern	5 00

On the other hand, when the heat of a naked flame will endanger the safety of glass vessels or when a temperature above 212° F. must be avoided, you will need,

A sheet iron sand-bath, 4 inch	$0 20
A copper water-bath, 5 inch	1 25

But excellent substitutes for these are found in the tinned iron stew-pans of the household. Those which are seamless and made from heavy stock are quite durable, and when furnished with rings are much cheaper than the copper bath, which they replace. These rings can be cut out by the tinman. They are circles of sheet tin cut large enough to cover the stew-pan with a hole in the center of each. Let three be provided, the diameters of the holes being one and a half inches, two inches and three inches respectively. In this way both baths need not cost over fifty cents. And then for various small operations in melting and ignition, several pieces will be required.

½ dozen crucibles, Royal Ber. porcelain, No. "0"	$1 00
1 Dozen Battersea crucibles, round, No. "B"	50
Platinum foil, 1½ inch by 2 inches	....
Platinum wire, for blow-pipe, 3 inches	....
Mouth blow-pipe, brass, jeweler's form	50
Pair of crucible tongs, iron	1 00
Pair of steel forceps	25

Platinum is sold by the grain or the gram, and the cost of these pieces will depend on their thickness and size. If you order "platinum for blow-pipe use" the dealer will send the proper quality at thirty-five cents per grain, and the two pieces may cost about one dollar.

5. *Weighing and Measuring.*

The operation of weighing is likely to be called for at almost every stage in the course of chemistry; it is also common in the

sister department of physics. Hence a *good balance* is a most important desideratum. But a good balance need not be a costly one. Very fine weighing, which is so important in analysis, is not imperative in general descriptive chemistry. An instrument which is sensitive to one-twentieth grain or about three milligrams is accurate enough for the work here. In one form of balance the pans rest on supports above the ends of the beam; in the other form they are suspended by bows. This last is the style of all the choice analytical instruments. But the first, although of lower grade, will do the work of an elementary course of general chemistry in a satisfactory manner, and for some purposes, such as the balancing of flasks and other light bodies which are of considerable size, they are actually to be preferred. One instrument of this kind is to be found catalogued under the following description: "Balance of fine construction, with sliding weight on graduated side beam. Beam divided for grains and metric system. Pans four inches diameter, plated, to weigh up to one kilo (two pounds). Sensible to one-twentieth grain. Accompanied by a set of weights fitted into the base." The price of this balance with its weights is nine dollars.

The very cheapest of the other form which can be recommended is more than twice the price of the balance just described. Becker's make would be chosen and it would be that one described as "Becker's No. 19." This instrument will weigh from ten ounces down to one-twentieth grain, and is placed on the list at twenty-two dollars.

Both the English and the metric weights ought to be at hand; the first because they are the weights used in commercial transactions, and the second because they are in almost universal use for scientific purposes. Then let the weights which are furnished with the cheap balance above described be English, and purchase an independent set of French weights to be used with this balance in chemistry, and the specific gravity balance in physics.

For general academic work the weights need not be of the very finest quality. There is a grade furnished which, for accuracy, stands between the analytical and the common weights, which may be recommended for use whenever the strictest accuracy is not required. These weights are of "German make" and well adjusted. A set, from 100 *grams down to* 1 *milligram* is to be bought for five dollars.

This price includes a polished wooden case *and cover*, which is a great help in the preservation of the pieces. Without this cover the same set can be had for two dollars and eighty-five cents.

Some variety of graduated glass-ware, for measuring liquids, is quite an important part of the chemical outfit. This graduation may be in English measure on one side and in metric measure on the other; it is well to have this double graduation. The following pieces constitute a useful set:

1 glass graduate, 1,000 cc	$2 00
1 glass graduate, 250 cc	1 20

1 glass graduate, 50 cc	$0 55
1 graduated cylinder, on foot, lipped, 50 cc	75
1 litre flask, stoppered	1 00
1 pipette, 1 mark, 50 cc	50

6. *Solution and Precipitation.*

The glassware for these purposes should be well annealed and uniformly thin. The Bohemian glass is likely to possess these qualities in the highest degree. There will be needed,

1 nest of beakers, 5 ounce to 20 ounce, Griffin form	$0 95
2 dozen test tubes, 6 inch	75
1 test tube rack	50
1 test tube brush	10
3 test glasses, cylindrical shape, 4 ounce	75
2 cylinders, on foot, lipped, 12 inch	90

These cylinders are also useful in collecting and examining gases.

7. *Evaporation, Distillation and Filtration.*

Evaporating dishes are furnished, as beakers are also, either in single sizes or in nests. They are of porcelain, and the Royal Berlin is the most valuable ware. A nest of six dishes, with capacities ranging from one ounce up to eight ounces, is a convenient set. The price of this nest is one dollar and fifty cents.

The sand-bath, the water-bath, and the retort stand for support, are the accessories in this process.

Distillation may be conducted with tolerable success by means of pieces already mentioned. A flask in which the water may be boiled, provided with a bent delivery tube, the other end of which is inserted into the neck of a second flask or bottle, kept cool to condense the steam, will constitute the set. Nevertheless such an arrangement must be regarded as a substitute, and it is not altogether satisfactory, especially when it may be necessary to obtain distilled water in considerable quantity for use in experiments. A better apparatus will consist of

1 retort, stoppered, 1 litre	$0 70
1 Liebig's condenser, metal, 20 inch	2 00
1 support for the condenser	1 50

In ordering these pieces ask the dealer to select a retort whose beak is small enough to enter the end of the tube of the condenser. Even if he must draw it down to make it fit, the little extra will be well repaid by the greater facility in making this connection.

For filtration the only additional pieces absolutely required are the funnels.

3 glass funnels, 2½ inch, 4 inch, 6 inch diameter	$0 75

The price here given is that set down for funnels described as of the *best German make.*

Instead of a filter stand, which would cost about one dollar, the bottle or flask which is to receive the filtrate may support the funnel, whose stem may be thrust through the neck. For filters get the quality described as the "best German white."

1 quire filter paper, 19x19 ..... $0 35

8. *Application of Electricity.*

The electrolysis of water and its synthesis are the types of operations under this head which are likely to occur in the academic course of chemistry. For the first of these purposes there is needed an

"Apparatus for the decomposition of water"..... $4 00

It is not easy to find a wholly unobjectionable form of this apparatus described in the catalogues. Hofmann's is a beautiful piece of apparatus and it is capable of yielding accurate results, but with small battery power it is likely to work slowly and it is rather costly; twelve dollars or eight dollars and fifty cents, according to whether the tubes are graduated or not. For lecture purposes it is not absolutely necessary that the tubes should be graduated, a very acceptable substitute for graduation being secured by stretching small rubber rings over the tubes at distances apart which mark equal volumes.

The price given above contemplates an instrument of different form. The tubes are *hung from an arm* which projects from a standard rising from the base on which the cistern stands. The tubes should not be less than ten inches in length, and twelve inches would be better.

The battery described in the list of electrical apparatus will furnish the current for this decomposing cell.

And then for the synthesis of water get a eudiometer.

Bunsen's eudiometer, 50 cc in $\frac{1}{5}$ $2 25

Notice that this instrument is graduated in cubic centimeters. Eudiometers ars often graduated in millimeters which is not so good, since the cubic centimeter graduation enables the operator to read the actual volumes of gas employed, while the millimeter scale gives proportions only.

Bunsen's eudiometer is a straight tube; if a bent form is preferred then Ure's will be ordered costing a trifle more. A Bunsen with 100 cc scale will cost but very little more, perhaps seventy-five cents additional, but since the explosion of mixed gases is likely to be limited to small quantities, there is little actual need of a large eudiometer.

The Ruhmkorf coil mentioned with the electrical instruments will furnish the sparks for the eudiometer.

9. *Miscellaneous.*

Under this head we will mention some articles which make themselves "generally useful" about the laboratory:

12 feet rubber tubing, $\frac{3}{16}$ inch inside	$1 08
12 feet rubber tubing, $\frac{1}{4}$ inch inside	1 56

The first of these pieces will be used for connecting glass tubes in the preparation of gases, and the second for leading gas from the main to the Bunsen's burner, as well as for other purposes in both chemistry and physics.

Rubber tubing is in pieces of twelve feet each. It is sold by the foot, but by the piece it is a little cheaper. The price of the first named pieces above is that for the variety which is wrapped in cloth, a desirable feature.

$\frac{1}{2}$ lb. glass rods for stirring	$0 25
$\frac{1}{2}$ lb. combustion tubing	50
1 combustion spoon	25
1 piece cobalt glass, 3x3 inches	10
1 set of cork borers, six, brass	1 50
1 cork press, cast iron	45
1 iron mortar and pestle	75
1 porcelain mortar, glazed, 4 inches	60
2 pinch cocks, Mohr's, brass-plated	40
2 pinch cocks, Hofmann's, brass plated	60
1 round file, for corks, 4 inches	20
1 triangular file, for glass, 5 inches	25
1 pair shears, for metal	1 50
1 support, table form, 12 inches	75
1 doz. bottles, salt mouth, stoppered, 8 oz	75
3 doz. bottles, tinctures, stoppered, 8 oz	7 50
1 book of gummed labels, new formulæ	50

These bottles will be needed to contain solutions and solid chemicals, and ought to be of the best glass with well fitting-ground glass stoppers. They can be bought with the names and formulæ blown in the glass. Such may have some advantages more marked, however, in the analytical laboratory where certain re-agents are to be invariably present. But in general chemistry it sometimes happens that the particular solution in use finds no corresponding label among the bottles where an unnecessarily large stock is not kept. On the other hand, the gummed labels are quickly and easily applied and readily exchanged, so that the plain bottles will, in the end, give the better satisfaction.

NATURAL SCIENCES.

Geography. — Here a good terrestrial globe is of the highest value. Its diameter and style of mounting determines its cost. One twelve inches in diameter with full meridian and horizon, can be bought for thirty dollars. And then a set of wall maps can hardly be dispensed with. The price of these also will depend on the size chosen. Such as Guyot's "Intermediate," which measure four feet by four feet, will answer for all but the largest rooms. This set includes eight maps and costs thirty dollars.

Botany and Zoölogy. — Fortunately, in these branches, the objects for study are furnished by the field and the garden. Objective study is, therefore, more easily carried on and is less expensive in apparatus than it is in physical science. Nevertheless a few articles are almost indispensable. Among these is a *microscope.* One of the best for use here is the *Bausch and Lomb* dissecting microscope, sold by the "Bausch & Lomb Optical Co." (37 Maiden lane, New York), at ten dollars. The following accessories are fully worth the additional cost, since they convert the simple instrument into a very good compound microscope, viz.: "Extra arm with tube and eye-piece," eight dollars; and an "Achromatic Objective," one-half inch, nine dollars. In this way you obtain a microscope, excellently adapted to a considerable range of work, for twenty-seven dollars. We will also add a list which shows the most important pieces needed if *dissecting* is to be done, either of animal or vegetable tissues.

1 hand-rest for the dissecting microscope	$2 00
1 scalpel	75
1 pair ordinary scissors	1 00
1 pair delicate dissecting scissors	1 00
1 blow tube for inflating lungs, etc	40
Forceps, several pairs	1 00
Pocket magnifier, two lenses, rubber case	1 00
Dishes, sponges.	

Of course, if the class is to engage in experiments for itself, these pieces will need to be duplicated, and at least one more microscope, but without the extra tube and lenses, will be desirable. On the other hand, if such work is not contemplated, little more than the microscope and accessories first mentioned will be required.

It is highly important to have, also, some charts and some elementary sets of specimens for illustrating the study of classification in natural history. Such a set of natural history charts as that of C. Gilbert Wheeler (wall charts) costs thirty dollars. A set of fifty genera of shells, 100 species, can be bought for five dollars (Dr. A. E. Foote, 1223 Belmont avenue, Philadelphia), or twenty-five genera, fifty species, one dollar and twenty-five cents. Sets of insects and sets of stuffed birds can also be obtained from the same house, but the former, especially, are extremely perishable, and therefore not to be recommended.

Mineralogy and geology. — Specimens are highly important in teaching these branches. Mineralogical sets, containing 100 specimens each, are furnished by Dr. Foote at prices depending *on the size of the specimens*, six dollars, twenty dollars, twenty-five dollars. His twenty-five dollar set is the one which he has intended for academies. A set of "Hardness Tests," for one dollar, or a better one for two dollars, and a "Color Series," twenty-five specimens for one dollar, or fifty specimens of five dollars, would be very useful.

If you desire to let the students make a few simple experiments in mineralogy, you will be able to do so with the following pieces:

Jeweler's blow-pipes (say 3)	$0 75
1 pair platinum pointed forceps	2 50
1 pair steel forceps	25
Reagents	1 00

Fine platinum wire (chemical list).

A set of the more common and characteristic fossils, requiring an expenditure of say twenty dollars, or even of fifteen dollars, would be very helpful in teaching geology. So would be

1 geological compass	$3 00
1 geological clinometer	3 00

Or the compass and clinometer combined in a first-class instrument (J. & H. J. Green) can be bought for ten dollars.

The prices quoted throughout these lists are those of single pieces of single sets. Doubtless reductions would be made for large orders.

DO OUR SCHOOLS TEND TO DESTROY PRACTICAL TALENT?

By Principal G. W. GILLETTE, Schuylerville, N. Y.

There are those who claim that the higher education given by our schools lacks those elements which tend to fit youth for the ordinary affairs of life, fostering vain preferences for the so-called gentlemanly pursuits, placing such a chasm between poor children and their parents that it renders happiness more uncertain and success in life more improbable. It is not an uncommon thing to hear men declare that extended study in school is a waste of time, backing this up with stories of lads of the right kind of metal, who, taken from the streets, have won the highest success, while, with instances of educated youth, they draw pictures of blank failure, not infrequently concluding that our schools spoil young men for business by prompting them to shun hard work.

We are told that, as a result of the poor teaching done in our lower departments, which are largely responsible for the education of the business community, each year sees crowds of boys and girls passing from our schools into society and business with no impressions remaining on their characters; and so specious have been the pleas of late, so much fuel added to the fire of discontent, that we seem to be at a point in educational history when change, if for nothing but novelty's sake, is the order of the day.

Now, if our schools tend to destroy practical talent, as all this array of fault-finding might at first lead us to think, either radical change or thorough improvement should be the nation's first duty. No one would dislike to see improvement, and not a few have produced theories whereby, in their own estimation at least, such a result might be achieved. But when we begin to look for a substitute for the present system of public instruction, it behooves us to examine closely those centers of energy which have so long given life to our present system, and which, in the general panic for reform, are liable to be disregarded.

There is, probably, no word in the whole English vocabulary that is used so commonly, when referring to the meaning of success in life, as the word "practical," and no word that is more misused. In this hurrying age, we are liable to lose sight of that patient deliberation, that wise preparation for the grave duties of life, that zeal tempered by wisdom, all of which go to make up the truly practical mind. There is too much usurpation of the so-called practical over the thinking. As some one has said, people are sometimes too practical to be altogether pious, and sometimes too practical to be decent. The usual acceptation of the word "practical" thus becomes an unsafe one, either for the individual or for the nation; depending too much upon the glittering possibilities of the moment, losing sight of the principles which underlie success, rejecting the light of experience being, in short, altogether too superficial and common-

place. The truly practical mind possesses a rare combination of qualities, enabling one to apply his knowledge and reasoning faculties in the best way to some useful end. Nor is practical talent confined to mere business habits. It may be the possession alike of men of every profession and pursuit. Because scholarly men, like Bacon and Addison, showed little tact in turning their knowledge to worldly account, does not prove that they possessed no practical talent. It required as great practical talent for Bacon to hunt out, combine and generalize the great truths underlying his philosophy as for our modern Jay Goulds to institute and carry to success the colossal workings of some great commercial syndicate. But if we take the word "practical" in its more common signification, what have our schools, that is, those which give primary instruction, to say for themselves, in the development of this rare combination of qualities?

In this age of change in social conditions, of increase of sedentary life, developed by the utilization of steam and other motors, by the immigration of those both willing and anxious to perform manual labor for a living, by the increase of wealth, with its general and well-known influences upon the energy, it is not strange that there should be a growing indifference among our educated classes toward manual labor, and, as a consequence, a seeming, if not a real, depreciation of practical talent. For these influences on the talent of the rising generation, we do not hold the schools responsible. Parents, in this age, are too liable to think that, because their children do not take the same course as they themselves took to build up a reputation, exhibiting, with all the increased disadvantages of the age, the same practical talent, the schools are to blame for the result. They are, at least, extremely liable to put this construction on the failure of poor but educated young men, who, struggling through the vicissitudes of life, happen to falter by the way.

There are those in our schools who are impractical from circumstances. Indulged in every thing that wealth can bestow, and regarding themselves above want, and therefore above the absolute necessity of work, they have that in their natures which no instruction, however scientific, can entirely eradicate or counteract. No system of public instruction will be able to put into youth, entirely unsphered from scholarly or business bias, that which will make them practical, or inspire them with business habits.

Thus, much of the evil resulting indirectly from our present system of public instruction finds its more direct cause in conditions lying outside of our schools. That vitiated taste of public sentiment, which places policy before honesty, finds expression in the meretricious show of graduation day. That desire on the part of parents for untimely brilliancy of intellect in their children explains much of the abnormal projectiveness so typical of the work done in some of our schools. Not the system, but the spirit which pervades society, leads the educator to resort to the arts of the politician, both in maintaining his position and increasing his patrimony,

breeding dishonesty in his pupils and a false pride in the hearts of parents.

That our highly educated boys and girls generally despise manual labor is easier said than proved. There was a time when a college education was considered a stepping-stone, mostly to professional life, and it is undoubtedly true that years spent in studies, which excite the imagination and inspire the mind with lofty conceptions, make one at first regard the routine of business as dull and uninviting; but it is a mistaken idea that the character and aspirations of American boys and girls can rest for any length of time upon a principle so abortive, especially of those who, by necessity, are predisposed to effort. Americans put too high a value on business life for that, and the craze of wealth-getting carries large numbers of the educated, as well as the uneducated, into business life. The masses are too well-informed longer to harbor the idea that there is success in the professions for all that are college bred. So long as there is a demand for highly educated men and women to fill the professions, there will be a tide tending toward this vacuum; but when the professions become overcrowded, a large class of well-educated young men, men who have known what the up-hill side of life means, will, as they are doing to-day, resort to non-professional pursuits, and with an energy which bepeaks success. Those who are waiting — trying what their wits, what trick may supply — are generally those whose life, outside of the schools, has predisposed them with feelings of caste. Bring me one listless educated youth and I will bring you half a dozen uneducated loafers, who never manifested any disposition to do any thing creditable even for wit's sake.

The argument that the liberality of our present system of public instruction is doing an evil, especially to poor girls in elevating them above their positions in life, hardly finds sufficient evidence to make it valid. There is no doubt but that many poor girls and boys, if they had been left in the sphere in which they were born, would have done better financially than they are doing in those fields of action to which their education has elevated them; many of them do not possess the bravery to struggle against the opposition which the competition of the age introduces. And yet those who have the strength and ambition to pursue long courses of study in our schools usually possess the very qualities which enable them to do well in whatever pursuits they follow. With all the defects of our schools, the education which they give enables the poor classes to exert greater power in creating an interest in their welfare than could otherwise have been possible. The very feeling which, after years of preparation, prompts them to do something creditable increases their exertions, and thus enlists the efforts of those empowered to assist them. Aside from those whose education is a mere matter of form or of custom, and therefore superficial and impractical from conditions of birth rather than from general defects in the instruction given, the young men and women who go

out from our schools generally have that which enhances their prospects in life. Those who, in their race for honor and position, make the best of the advantages offered, need have little fear of failure from competition with those whose education was not prompted by necessity. Men of influence are as loath to give their work or their children into incompetent hands as are others, and they generally regard poor and deserving youth as better workmen than those who seek education without a purpose. With all needed exceptions, our schools are not placing a ban on the progress upward of that noble class who, by their efforts to elevate either their social or their worldly standing, are making the most of the liberality of American systems of instruction.

It is in a measure true, as Bishop McQuaid says, that the present system of public instruction "has failed to lift society from its degradation and clear the streets of our towns and cities of the 'street Arabs' and other dangerous classes;" but because it has not done the part belonging to other elements of social and national power is no argument against the schools. Worldly success depends largely upon business integrity, an element, therefore, whose function in the human economy cannot be separated from practical talent. Allowing that the schools do not hold the illiterate classes in attendance through the period of character formation, there is no element *more* potent in the eradication of those habits incompatible with business integrity; no body of people with whom the children come in contact during their most impressible years more faithful, sympathetic, potent and unselfish; nobody that is winning more lasting laurels in practical work by instruction which distinguishes between the rights and wrongs of life — instruction which asserts its claim upon the heart, deportment and all that ennobles life; no body of people who, through their deeds and bearing, are doing more in fixing the primary condition of good citizenship and business success than the high-minded teachers of to-day.

Again, there is a large class of children, especially in our city schools, who, if deprived of school instruction, would never know what good habits of tact and labor mean. Their parents, accustomed to listless and irregular job-work, begging and perhaps stealing, shabby, hungry and often houseless, afflicted with dissolute habits, never exhibiting any tact, energy or persistence (save that of godless vagrancy), teach their children to get rid of a dollar the moment they receive it, but seldom inspire them with the spirit of temperance and frugality. True, not all such children are reached by our schools, but thousands are thus reached.

Education for business does not mean what it did fifty years ago. The rapid exhaustion of the natural fertility of the soil demands of farmers a more thorough appreciation of what is necessary to replenish that soil. The increased variety of our manufactures looks to more skilled artisans to design and tradesmen to distinguish between the real and the spurious article of merchandise. In fact, society stands on a different basis. Causes by the score, which were

formerly unknown to the business man, affect prices to-day, such as frequent changes in currency, tariff, and laws; the fluctuation of the money-market, immigration, exports and imports.

The business man may not need that scholarship which produces the greatest array of facts, or the greatest profundity of special knowledge. He needs more particularly that which, as Carlyle puts it, is the foundation-stone of all but false, imaginary culture, viz., that which enables men to do somewhat or, in other words, education organized into faculty. It is true that too many of the teachers of to-day have not been able to appreciate the difference between true education and a merely filling up process. But educators are more generally appreciating the true science of their profession. There is no more gratifying evidence of progress than the recognition among educators of the essential importance of the primary schools — the main structure of all public education which has a bearing on worldly success. If training of the mind means any thing, it means the inculcation of that which will enable it to act with more power, certainty and effect upon whatsoever particular object its faculties are exerted. If we regard the mind as something that always grows and which can never be furnished; if we regard knowledge as the result of mental action or that which trains the senses, cultivates the observing faculty, strengthens the memory, exercises the imagination and develops the thinking power, the judgment and the reason, we can never regard a person so exquisitely cultivated as to have lost his energy. It is no argument that our schools are impractical because certain of our so-called educated men fail in business. A person may have scholastic attainments without having the essential qualities for worldly success.

Only a comparatively few business men are able accurately to trace causes of market or interpret the signs of the times, most of them depending upon others for this information. It is not necessary that all should possess that comprehensiveness which is able to grasp the sum-total of the most complicated problems, or that power which enables them to confine the minutest attention to details. But in this age of competition, when there is a continual occurrence of unanticipated exigencies, all kinds of business, even to the most limited specialty, demand talent more comprehensive, minds more critical, and a vision broader and more intellectual than was true fifty years ago. Now where shall we go if not to our schools for satisfying these new and increasing demands upon the business man.

Nor should too much stress be put on mere industrial training. No one, whether his instruction be primary or secondary, is going to make a practical application of all he knows; even allowing that he forgets much of what he learns in school, it has left its impress upon the judgment, upon the powers of abstraction and reasoning, and upon the power of acquiring other knowledge to be gained later in life. In this sense our schools are not an industrial failure. Touching all the prime conditions of productive industry — awakening desires and impelling to effort, giving ingenuity to the mind and

cunning to the fingers, they promote that power of thought which turns every thing it touches to gold, and beget those two great conservators of wealth, intelligence and character, which lie at the base of all true industry. The increased study of the sciences is bringing the minds of those instructed more directly into contact with inductive reasoning and to the immediate observation of nature, giving that discipline which the age demands of those whose pathway lies along the pursuits of business. The spirit of industrial training is being regenerated and adapted to the needs of the age and nation. The elements of technical knowledge, such as industrial and mechanical drawing, geometry, book-keeping, etc., are taught in our best schools. There are advances more practical and important than any weak attempt of our schools to make artisans.

Our schools have been charged with too much routine work, too much time spent in details. And yet in the race for riches which comes to so many in after life, much depends upon this very work, though monotonous work; and minds so accustomed will be less inclined to despise the small and gradual advances by which wealth is generally accumulated. To cultivate greatness of conception is no more the work of the schools than to cultivate the power to do neatly, accurately and with precision those small works of detail which fill so great a space in the field of human life. Our schools must give not only that instruction which will furnish a rich pasturage to minds of the highest calibre, starting them on a fair upward course, but a more "common place instruction to common place minds."

It is claimed, moreover, that there are too many branches of study introduced into the courses of our schools; that as a result our schools are overworking their pupils and are not as thorough as they were in the times of our fathers. The length of the present courses has resulted from the gradual introduction of new studies, studies having a more especial bearing on the material living and, at the same time, the clinging to the old-time courses in all their latitude of subject and substance. It is not the number of studies in a course, however, which makes it difficult or injurious, but the injudicious use made of those studies. The old plan of finishing the book, work which in many schools admits of no abridgment or substitution for text, and the indiscretion and recklessness of many superintendents need not be questioned in relation to the above charges, and yet the blind following after book manufacturers, who make their text comprehensive that their books may have a wider sale, is gradually giving way to what experience has shown to be more useful and practical; book-makers, in other words, are learning to specialize their works and adapt them to the needs of the broadened courses. More election in studies is being allowed, more grouping of classes and grades in general exercises, more liberty in the alternation of classes or the substitution of weekly or bi-weekly exercises for those which formerly were held daily. One of the most encouraging features in the immediate outlook is the growing disposition on the part of su-

perintendents toward giving teachers more latitude respecting the amount of subject-matter to be presented within a specified time. Superintendents are calling their teachers together oftener, and by generalizing the facts, experiences and theories thus accumulated, are adapting their courses more to what common and actual experience dictates and less to their own fancies — fancies which are often founded on mere supposition. So that, while the courses in our best schools are still broadening as to number of studies and comprehensiveness, the charge that the work is generally too difficult is hardly founded on reasonable appearance of truth.

The thoroughness of work, moreover, does not depend upon the number of studies. It is not necessarily the question how much of arithmetic or of grammar or of any special study a boy shall get, but how much of that general instruction which shall make him a better and more useful man. The right kind of teachers are thorough in all they undertake, and make all their instruction count in the general development of the minds in their charge.

During the past year there have been some very able discussions on the lack of physical exercise in our schools. And yet no remedy has appeared that seems entirely practical, or, in many cases, available; no substitute for the play-ground, with its impetus to the play impulse, its community of effort in inviting to hearty and healthful exercise. Few would prefer that their children should be confined at home or within the bounds of parochial discipline. Few, I believe, would think of substituting street games or private pleasures; and it is questionable whether the "no recess" plan will be generally accepted as the most beneficial and available. Granting that there is too much close confinement and overwork, too many false standards of advancement in our schools, which do in a measure detract from the gradual healthy development of mental and physical powers, and, consequently, from the ability for usefulness, especially in pupils who are physically weak, yet it is not clear that this evil is general. In all work in which emulation and competition come in, whether physical or mental, the strong have the advantage over the weak. Injuries thus received, however, must be corrected individually rather than generally — injuries which, in the aggregate, are not to be compared with those arising from the mental, moral and physical perversion which idleness, ignorance and vice generate — a perversion which finds expression in crime, prostitution, disease and degradation — a perversion which decries our higher education, our free schools, and would beget a barbarism destructive of our present civilization.

Delusions do not affect ignorant people alone. That there is much of the reform of to-day, regarding the instruction in our schools, that is inconsistent and false in its professions is seen in the fact that each year introduces and explodes many of these new theories. That there is that in our present system and methods of instruction which is too valuable to be hastily cast away, too old to need further testing, too practical to be replaced, too typical of

American institutions to admit of any substitute is beyond controversy. That we are destined to make improvements needs no better indication than the general awakening among educators, and thinking men and women of all classes. The improvement in general methods during the past five years is very marked. The fine handling of material in mere show-off exercise is giving way to that honest, manly bearing among teachers, which rises above a helpless dependence upon unprofessional men and outside ignorance. The old "long-figure," or class exercise, is hereby superseded by the individual method, the only method whereby all classes, creeds and nationalities with different home influences, and different social surroundings, can be reached — in short, the best method for the development of practical talent. There is less manufacture in educating, and more growth; less dependence on art, and more on nature; less dependence on text, and more on actual experiment. Through educational journals, teachers are comparing notes and gaining new inspiration.

To discuss before a class of pupils a little of politics and economics, business tact and stratagem, has become less a heresy than it was wont to be regarded. Reform is becoming possible, moreover, on the ground that teachers are becoming more generally conversant with the best methods of instruction, for with poor teachers the best methods will either remain as mere theories or relapse into mere tread-mill work. Reform is becoming possible also, on the ground that better teachers are being placed in the lower departments of our schools, which are so responsible for practical results, both in primary and secondary instruction. Grasping something more of the great world at large with its hundreds of specialties and becoming more imbued with the responsibilities of their position, teachers are becoming better fitted to inspire their pupils with a love for those pursuits which have a bearing on the common affairs of life.

Principal MILLER, of Haverling — I am pleased to have this subject brought before the convocation. If there is any one thing that teachers have suffered from it is from the general criticism in newspapers on the failure of their work, and the criticisms are generally made by those who have not examined the work teachers have to do — all the surroundings of the pupils whom teachers have to deal with. The schools take the children to begin with and deal with them, with all their natural tendencies; they take them with all the influences of society against them; they take them with the tendencies of a great many homes against them; with all the street influence against them; all the sectarian influences against them very often; they take them with all the influence of wealth against them; with all the babying of mothers against them; and one of the worst influences brought to bear upon the child is babying. Babying has ruined more boys and girls than any thing else. These schools have to withstand all these influences and at the same time seek to elevate all these pupils. I was very glad to hear the writer of the

paper take up the subject and defend teachers and their work. One word in addition to what has already been said. There has been a good deal said about education raising the pupils — the young men and women — above their rank in life. I would like to know who has the right in this country to talk of rank? I would like to know if Abraham Lincoln and Mr. Garfield did not come from the poorer ranks of life? Do those find fault because the public schools raise boys and girls up into their rank in life; if they do, they have no right up there, and the boys and girls have a right up there. That is one good thing about the schools. I do not believe boys and girls are injured by being educated. As I left my home to-day I left five men and boys at work in the field; the best educated hand in that field is the best hand in that field. The next best hand in that field is a boy who can read Greek and Latin; he holds a Regents' certificate and he can do more work than any other man in the field, except the man who is better educated than he is. There are ignorant men on that farm. How about the girls? Education does not unfit girls for life — not at all. A girl well educated — I mean thoroughly well educated — will make a better housekeeper and a better wife and a better mother than an ignorant woman can make. It is a libel and a falsehood to accuse our schools of unfitting the girls and boys for life. But there is this, in regard to our schools, that is open to criticism. It is very likely we think too much of the necessity of learning to read and write, and learn arithmetic and grammar, and those things which we study in school, as if the main end of education were to learn these things. We educate to make good citizens — good men and women. Go to the State prisons, and you will find from ten to twelve thousand men, women and boys shut up there. Why are they there? They are not there because they never learned to read or write. They are there because they never learned to obey; that is the one lesson they never learned. That is the one lesson we want to teach in the schools. The boy or girl who learns to obey well is safe. They will never hear the sentence pronounced upon them. The first lesson is to teach boys and girls to obey the law. When they learn that, they will keep out of our State prisons, our jails and our penitentiaries. Another thing in the paper — I was glad to see it commended — to teach that all labor is respectable, and that instead of making a boy or girl coming from college less efficient, it makes them better; the boy should be a better son, and the farmer a better farmer; the book-keeper should be a better accountant in the counting-room; he should be more faithful in the store; he should be more reliable in every walk in life, because he is educated; and the girl who comes home from the school with an education is more valuable in all that pertains to womanly qualities than if she had not been there. If our schools fail in doing these things then our schools are a partial failure; but, with the writer of the paper, I agree entirely that other influences are to blame for the conditions which the teachers are blamed for; some criticisms, I will be compelled to

say, contain the germ of truth. I would suggest, in connection with this matter, that we keep that fact in view, that our business is to make the children valuable. They are like the iron that comes to us coarse from the mine to be refined by heat, to be purified, ground and polished, and changed from the coarse article, worth four cents a pound, into springs and things of that kind that are worth thousands of dollars per pound. There is just as much difference between a coarse rude boy and an educated boy as there is between a pound of pig-iron and the watch spring. That is the business of our schools; this refining process; this humanizing process, and I believe our schools are doing it.

Principal HILL, of Havana — Mr. President — I agree with what the last gentleman has said, that the greatest object of education is the development of manhood and womanhood; and that that education is the most practical which does this to the highest and best extent. It seems to me that the greatest work of the teacher is not the knowledge that he imparts in the school-room and from the text-books, but the example that he is to his pupil. If a boy or girl is educated by an impractical man or woman, he or she will be educated in an impractical manner. Education involves more than mental training, and that is just what we forget. Education takes up all the faculties of the human mind and heart, and in the development of all these consists education. As has been said, influences may very often work against the influence of the teacher, and it is just here that it seems to me a well-conducted boarding school is better calculated to develop the highest type of character than another class of schools. I think that the academy is the public school of the people for this reason, that within its walls are gathered not the representatives of a single community of morality, but the representatives of all communities; not the representative of a single trade or occupation, the representatives of all trades and occupations. Thus developing together, the mental intercourse that comes from that union is most beneficial in developing that class of men and women which make the best citizens in a republic like ours. It seems to me that the great defect of our public school system is just this: that the students are not taken away from home influences, and that a great part of the influences of the school are counteracted by the influences of home. Another point that I wish to make just here is this: the teacher, as I have said, is most influential in developing the character of the child, and, therefore, that school is most beneficial which can determine by some fixed rule what teacher shall be in that school. This cannot be done under the public school system. It is very important that the boy should be educated by a man who does not use tobacco. A boy of mine could not be educated by a man who used tobacco in any form, and it is the same with liquor and other things. Some teachers use tobacco and liquor, and spend a good deal of their time in playing billiards, and I repeat that is not the kind of a man I want to educate a boy of mine or a girl of mine. In the

academy I represent we have a dozen teachers. The first question asked an applicant applying there for position is "do you use tobacco?" If he says yes there is no further consideration of that gentleman. The second question is "are you an active and earnest Christian man?" If he says no, then we throw him out. The teaching of arithmetic and geography is a secondary matter; the first thing is the character of the man you put your child under; I stand for the public school as represented in the academy — the Rugby of England, or the Eton; that school which is established and sustained by private funds, so that the boards of trustees are men of character, men independent of politics, who can put into those schools men and women that will educate other men and women, and build up society and not tear it down.

Superintendent BEATTIE, of Troy — There are some fallacies in the world connected with this very subject, and among them is one that is an old saw, that has been used and passed from mouth to mouth, from one generation to another, to this intent, that the educated man — and when they are saying that thing they are generally talking about college education — can make better hay, hoe corn better than an uneducated man. I never saw one of these educated men who could hoe corn, pitch hay or dig potatoes better than Mickey McFadden. He was brought up in the business. Now I did learn to make hay once, not as an educated man, but as a juvenile under the strict training of a good old Scotch father, and it was whack, whack when I dulled the scythe, and I had it further enforced every time I dulled the scythe by having to turn the grindstone. The principal part of the education was to keep the heel down and let the point take care of itself. As regards this matter of practical life and whether schools do or do not make us impractical, I am inclined to think that while a great many unkind things are said of our schools, especially by newspapers which ought not to say them, and a great many of these things are said in a very unkind way to decry the schools, nevertheless, the things that are said, I believe, those of us who are most intimately connected with the schools will be compelled to say contain the germ of truth. I have been connected for the last thirteen years with the schools of the city of Troy, and I take occasion to visit the girls of a certain high school near the close of the course, and ask them, how many can make a loaf of good, sweet bread — make it themselves. In these thirteen years I have found just one girl who could do it, and to prove it she brought me a piece of the manufacture of her hands, a piece of her own handiwork. Generally they do not know any thing about it. I do not know that directly the school is to blame for that. The school after all is to blame if it neglects to point out this very defect as regards these matters of domestic economy. Of course it cannot teach them, but the school is at fault when it fails to suggest these and kindred things to girls and boys, to the young women and men, and often, I confess, sir, I am one of those ready to take a step forward to tear down the old

school-house, and rebuild it and bring it to the convocation or some other meeting. Treating of the practical talk of industrial education, I was at Saratoga at the National Education Association, surrounded by all those splendid exhibits of Massachusetts, Philadelphia, etc.; there was nothing to me so greatly interesting, nothing to me so beautiful after all said and done, as the little marble stand on which stood the exhibit of Felix Adler, of New York. I believe every exhibit there was necessary, but this was purely industrial. Let us look at some of these things. How many graduates in the high school can drive a nail? Probably it will yet be necessary for some one of them to drive a nail every week in his life. How many can drive a nail without hitting his finger or splitting the board? Not one young man in a thousand can file a hand saw, not one woman in a million. Not one man in five hundred can properly fit up his jack plane when he would like to use it.

I do not wish to be understood as desiring to turn out all these good teachers and we have many of them — a host of them. I disapprove of much that has been said about teachers. I call it twaddle. I call it cant. I call it more. I call it slang — on that subject. The great host, the great majority of teachers in this State, in this country, are good teachers, because they are honest teachers, they have the spirit of teachers, men who do the work of teachers to the best of their ability and up to the height of the light which is in them; the others are in a small and diminutive minority. I do not mean to turn out all these teachers and fill up the schools with work benches and all things of that kind. I do not feel for a moment inclined to decry our system of schools. Only a fortnight ago we had a good deal of talk in our city about our course of instruction. Two or three of the members of the school board were impressed with the idea that it wanted a good deal — a terrible overhauling. It was defective; it was crooked; it was straight; it was too broad; it was too narrow. There was not any fault that did not apply to it when they got through. I believe they did come down to this that they would put in a little spelling, a little practical arithmetic and take out the small matter of geography, take a little dictionary, so that five terms would cover four, and the committee that had been appointed reported that it was a most magnificent course of study. It almost always turns out in that way. As regards the matter of ethics, I must say that my friend from Cook Academy has got to run out of teachers soon. I am the only fellow left for him. I was educated for that lower grade. Where I was brought up they chewed that bad, heavy tobacco; you could squeeze it and the poison would drop out. I thought I would be a full-grown man if I could chew. I tried it; got along bravely for an hour or two and then I had a spasm. Did you ever have one, Mr. Chancellor? You have lost half of life if not. I continued chewing it for a while and then I sneaked through the back door of the barn, slunk away to the house and have never used tobacco since.

Principal MILLER, of Haverling — About the gentleman asking his girls of fifteen if they could make a loaf of bread, I will answer that by inquiring if the question was asked Jefferson when he wrote the Declaration of Independence. Whether the question was asked James Madison when he wrote the Constitution of the United States. Was the question asked Lincoln at fifteen or De Witt Clinton. The business first of our life is to make mind — to make capacity to give the power of analyzing, the power of thinking; the power of adapting means to ends, of taking a bright view of life. The idea that we must all of us learn to make bread before we are fifteen! The men who have written and served the world, the women who educate our boys at home never made a loaf of bread at fifteen. That can be learned at twenty-five. I have not observed that it is the girls who worry over the last novel who are able to translate Homer.

Superintendent BEATTIE, of Troy — Does Principal Miller think that a girl of fifteen or over fifteen who has received a high school education, but who knows nothing about a matter so vital as this, is educated? Should this be entirely neglected to enable her to demonstrate propositions in geometry and translate Homer? Is she thoroughly educated, who, while she sits in the parlor and la-di-das over the last novel, lets her mother go down in the cellar and work the butter, is she properly educated?

Chancellor PIERSON — I was going to give my convictions on mowing as well as my friend, for I can mow, I learned it on my father's farm. I have not done it lately, not because of the education he gave me, but because I cannot afford to do it. While I am able to earn a good many dollars more I can hire a man to mow. My friend from Troy does not mow now because he is by his education able to earn more, but it has made him a practical man.

The object of this free education of ours is to lay the foundation of a large manhood. The best talent seeks the market. You see these men get up and elbow their way. The upper stories are all empty. You need not be afraid of winning a point if you are able to take it. Teach these young men the practical lessons of life. Teach them integrity, vitality — make them men. There is a young man of my acquaintance, well educated, honest, willing to work, to do the best he can of that he finds to do. He is in demand; he is never idle. I find men are idle because they are unwilling to work, or do not know how to work. You want a man of integrity and intelligence in any walk in life. The difficulty with many is they cannot work because they are not educated in the great State of New York, where young men and young women are educated in the common schools. This State is doing more to enlarge manhood for practical life and in making good citizens than any other State in the Union, and I am proud of it. You will pardon me for taking up time, but I must tell you I am delighted with those discussions — these broad discussions. I do not carry any grudge about the matter alluded to by my friend Mr. Hill, as I do not happen to smoke. I have been delighted with these discussions all day. I feel deeply over them and I therefore make these remarks.

NORMAL INSTRUCTION IN SCIENCE IN THE AMERICAN MUSEUM OF NATURAL HISTORY.

Remarks of Professor A. S. BICKMORE, of New York.

[Professor A. S. Bickmore, the Superintendent of the American Museum of Natural History in the city of New York, gave an interesting account of the method by which it was proposed in that institution to promote the instruction of science in the public schools of the city. Professor Bickmore's remarks were illustrated by lantern views of a large number of specimens, such as he used in his lectures to the classes of teachers. In opening his address he said:]

The institution which I have the honor to represent on this occasion was founded largely for the purpose and with the hope that it would prove efficient in educating the pupils of our common schools in natural history. The city of New York has been liberal to a degree that is unparalleled on this continent, and is particularly surprising to those of our friends who come from other lands. The trustees of this museum, which has been the recipient of this bounty, feel under a great obligation to do what they can for public education. They have, therefore, hoped that as the museum opened its treasures to the public that the teacher in particular would come and take advantage of the opportunities for information in the form which would be best adapted to their work of instructing their pupils; but we found when these teachers visited these immense and costly collections without instruction or guidance, they were simply bewildered by the wealth of material around them. In order that the benefits of the museum might be more fully and profitably enjoyed, the trustees resolved to attempt giving more systematic instruction. A communication, therefore, was sent to the board of education of the city of New York, giving notice that the Superintendent of the museum would give a series of informal talks upon the subjects of natural history, and inviting the board to send from each of their schools such teachers as might be most profited by this kind of instruction. It happened that the Saturday on which the first of these talks was to be given was a stormy day, but in spite of this nearly all of the teachers designated by the board were in attendance. We found to our great surprise that a new and unlimited field of usefulness was before us. The board of education expressed their thanks that these new opportunities for culture were to be afforded to the teachers of their schools. They expressed their desire that a course of such instruction should be provided and promised an increased number of teachers to attend upon it. It has ended in our opening our lecture hall to an audience of teachers coming one from each of the city schools and a small additional number from adjacent localities. The Superintendent has undertaken in these informal talks to give to his audience in perfectly simple and familiar language the principal elementary facts of natural history. This he has endeavored to do in matter and form as

nearly suited as possible to their wants as science teachers. It is believed that the result has been gained of a largely increased interest in the oral teaching of science in the schools. It was a comparatively easy thing for those who had heard these talks, and had seen and handled the specimens which were under discussion, to go back to their classes and give a much more vivid and interesting account than if they had learned the same things from books. The whole resources of the museum are, of course, available for the purpose of illustrating these lessons, but care has been taken not to overburden the instruction with a too great multiplicity of specimens; only the typical and important forms of animal life are brought before them, and these are employed to make plainer the distinctions existing among the different divisions of the animal and vegetable kingdoms.

[Professor Bickmore, in continuation of his discussion, brought before the Convocation a large number of views illustrating the methods pursued in the instruction given to the teachers. The exhibition was enjoyed by all, and it was felt that in this movement in the American Museum of Natural History there lay the germ of a great advance in the method of teaching science in the public schools of the State.]

ABSTRACT OF A PAPER ON "THE PHILOSOPHY OF THE COLLEGE CURRICULUM.

By Principal T. J. BACKUS, of the Packer Collegiate Institute.

The American college is a natural outgrowth from the American life. The plan of organization, the customary ecclesiastical alliances, the courses of study and the methods of teaching are native to the institution. They are not, as is commonly supposed, graftings from English or German universities. With all their defects they are giving the most interesting evidence that is given in proof of an original and trained intellect at work among our countrymen. They have appealed to the religious sentiment so effectively that all sects have it as one of the unwritten articles of their creed that collegiate training and religious interests go hand in hand. They have appealed to the philanthropy of the people, and with such effect that tens and hundreds of millions of dollars have been invested for the benefit of colleges. And yet very earnest objections are raised against them. They should be fairly treated. What is the purpose of collegiate education? Is it to make clergymen, physicians, lawyers? The course does not make a man professional. Its purpose really is to train the mind to the skillful use of its faculties. It is a system of mental gymnastics, essentially nothing else. Intellectual athletes, Jonathan Edwards and Francis Wayland among them, had given most serious thinking to the devising of a system of mental gymnastics, which, if faithfully pursued, should produce the best results in intellectual athletics. The college demands that a student must know before matriculation how to read, write and cipher. He must know the declension of Latin nouns and the conjugation of Latin verbs, the formulæ of algebra, the demonstration of some geometrical theorems, and less Greek. Language is taught because there is inseparable relationship between it and thought, and the college should, therefore, select the language most complete and systematic in its grammatical structure, and that, beyond all question, is the Latin. It was necessary to give Greek its prominence in the curriculum, because useful to every professional man. Either of them is rich beyond comparison with our other foreign languages. [After reviewing the various studies in the curriculum, the speaker returned to the legitimate purposes of the college.] It is to help students to active thoughtfulness, the power to think — it is not to help them achieve Latin, Greek, astronomy and natural sciences. It is not to give them their inheritance, but to fit them the better to use their inheritance when they shall come into possession of the problems which belong to the general and to the personal life.

Principal T. J. MORGAN, of Potsdam — Mr. Chancellor — I have very greatly enjoyed — as have the audience generally, which is evident by their cheering and applause — the admirable paper which has just been read. But with your permission, I would

beg to make a criticism upon the paper, not upon the gentleman's paper only, but upon papers of a current line that is adopted by many persons in advocating the general principle which is set forth in this paper.

While agreeing heartily with the able author in the main principles which he advocates, I would offer a criticism as to the form of argument used by him. Instead of saying as he does that the "object of a college training is to give not knowledge but power," I would say: "Its object is to give both knowledge and power." Time will not permit me to develop my thought, but I suggest that in any scheme of education, knowledge has a three-fold value. 1. Practical. 2. Basal. 3. Instrumental. The pupil should be trained from childhood to use his knowledge.

The knowledge of reading, writing, arithmetic, geography, science, history, philosophy, etc., have a practical value, not simply a money value, but they satisfy the natural desire to know again that each subject has organic relations to others. Arithmetic underlies algebra; grammar is necessary to comparative philology; philosophy of history is based on a knowledge of the facts of history. And then it should be borne in mind that knowledge is the instrument of mental growth and power. The senses become powerful only as the mind grasps clearly the facts of form, size, color, weight, etc. Memory grows in so far as it holds tenaciously to the facts of knowledge. The reasoning powers grow up clearly with facts and principles — which are objects of knowledge. Thinking, which is power, is observing, analyzing, comparing, classifying, co-ordinating material phenomena which his mind grasps as knowledge. Do we not weaken our argument in behalf of disciplinary value of college training, by emphasizing this too much and denying the importance of knowledge? We seek knowledge and power; knowledge through power, and power by means of knowledge.

Principal MILLER, of Bath — Mr. Chancellor — I heartily approve of the paper which Mr. Backus has just read. He has given us many good things with which I entirely coincide, and I rise to give my unbounded approval to the paper which we have all listened to with so much interest and delight. I have heard of watered stock, but we do not want any watered education. I am very glad to second Principal Backus' paper. I will give my hearty approval to it.

Professor BENNETT, of Syracuse — Mr. Chancellor — Why did not the gentleman say German or French, instead of Burmese? There is a sort of logical fallacy or a sort of dodging things, by putting the extremely unuseful where he ought to put the supremely useful. Now, if the paper had compared the service, the culture and the use between the Greek and German, I would agree with the gentleman and indorse the whole paper, except in that little bit of dodging. I wish I had an opportunity to explain more fully, but time will not permit. He has compared culture and power with disciplinary power, and the French and German with the Latin and Greek. The paper

does not meet the question fairly. We criticise students by the language they learn and we find that such criticism has a good influence. It is not enough to know a little of French, a little of Latin and a little of German; we ought to take these languages separately. Language is an educating force in every line of life. I believe in the doctrine of the paper and, if followed, it will make useful disciplinarians.

Principal SAWYER, of Utica — Mr. Chancellor — I most heartily approve of the paper and readily give my indorsement to it. I believe that a boy should be taught both of these languages. He cannot learn the modern languages thoroughly until he knows Latin and Greek.

Professor WILSON, of Cornell University — Some years ago I met an eminent old professor who thought and talked a good deal on this very topic. He had experience in the military academy at West Point and also in Columbia College. He made a remark which was received with great enthusiasm. It was said to him that the boys were received in the military academy at West Point without a knowledge of either Greek or Latin; while the boys in Columbia College were required to pass an examination in Latin and Greek before being admitted; and the professor said that the boys in Columbia who studied Latin for two years, and with that training, gained more knowledge and a more thorough mastery of the sciences in that two years than the boys at West Point did in the whole four.

Dr. KING on the same paper — I will also agree heartily with the gentleman in his paper and also indorse it. I think, and know for that matter, that if a young man wishes to get a thorough knowledge of the sciences, I advise him by all means to study the languages. Let him study the languages, meaning the classical languages, of course, for two years, and the sciences one year, and he will know more science in a single year than if he had studied science the whole three.

Principal FARR — Mr. Chancellor: I think it would be a good thing to have those excellent papers printed in pamphlet form and circulated at once among teachers and friends of education. It will have a great influence and will help the cause of education generally. I move, sir, that this paper be printed in pamphlet form and circulated among the schools and school districts everywhere generally throughout the State.

The Chancellor — I am sorry to say that it is very hard now for the Regents to get printing done. It is a lamentable fact that we have no means to do it. We have made several applications to the Legislature, with some success, and I hope that in a short time the Regents will be able to print their own matter.

THE TRUE IDEA OF A UNIVERSITY.

By ROBERT B. FAIRBAIRN, D. D., LL. D., Warden of St. Stephen's College.

That I am to present to you "The true idea of a University" is more than I expected to do. I was very desirous to hear the subject discussed in this convocation, and was willing to contribute to the discussion a few unwritten remarks. It is the kindness of your Secretary that places me here to-day to introduce the subject to your notice. I do not shrink from reasonable duty imposed upon me by the convocation or its officers; and I, therefore, without much hesitation sat down to put on paper some thoughts on the subject which I trust will bring out a free expression of opinion by the members of the convocation.

During the past few years we have heard a great deal about an American university, and many lamentations that we have no proper university in this country. There have been propositions and suggestions of various sorts about the establishment of such an institution, as if it could be manufactured to order. It has been proposed to place it at Washington, and to make it the center of high education in this country. There are constantly made also disparaging remarks on our colleges, and comparisons often are made with foreign universities to the great discredit of our own institutions. Lately also the proposition has been made by Columbia College to establish such an institution in the city of New York, and the sum of four millions of dollars is asked for to give it being and to insure its success. The creation, too, a few years ago of Cornell University led us to suppose that every subject was to be taught in that institution. Such is the declaration of the founder, which is sent out on the annual register: "I would found an institution where any person can find instruction in any study"; which might certainly be supposed to meet the demands of the age and of the country, and to retain at home the scholars who are seeking information in European universities.

Under these circumstances, having regard to this expression of various opinions, I asked the Secretary to bring the subject before this convocation. I thought that the country was in need of information — that we all required light. I felt myself somewhat confused on the whole subject, and instead of giving light I was hoping to receive light from others; instead of opening the discussion I expected, as I have said, to offer only a few unwritten remarks. All that I shall attempt to do is to bring the subject to your attention, and thus to afford the opportunity to others to discuss it in a manner worthy of its importance.

The word "university" does not carry with it the information which we require. The name would seem to imply what the founder of Cornell University proposed to himself when he founded that institution. It was to "give instruction to any person in any study." This would imply universal knowledge and would justify its name.

But I suppose that few, if any, institutions really propose such a course of instruction. No institution in the country offers such a curriculum. Indeed those that bear the name are generally the most contracted in their course; while some which gave the most extended course still rejoice in the name of college, as Yale, Harvard, and Columbia. And the same is true abroad. The curriculum of Edinburgh, of Oxford, and of Leipsic bear no comparison with each other. While Oxford is chiefly noted for its confederated colleges, for an undergraduate course, such as an American college affords, the higher education, or what we call a post-graduate course, was, until within a very few years, almost in abeyance; and the university lectures are not yet brought to that state that they will bear any comparison with a German university, where there is no undergraduate course at all, but where all the instruction is given in the four faculties of theology, law, medicine and philosophy. The word "college" with us brings definite knowledge. There is no material difference in the curriculum of the colleges of this country. When we hear of education in such an institution we know very nearly what it is, and what it proposes to effect. But the name "university," either here or abroad, does not give us definite information.

Then if we look at the history of the university, I am afraid that we shall not receive the information which we seek. The university which first received that name did not teach the branches which the university of to-day teaches. In the University of Paris, which was established as such in 1201, the seven liberal arts, as they were called, were first taught, and the faculties of theology, law and medicine followed at intervals during the latter part of the same century. Thus there was a university which has nothing like it at the present day in Europe. Harvard and Yale are more like the original University of Paris than is the University of Paris to-day. The arts were the important study of the university, and the degree of Bachelor of Arts was a title of the subjects which were taught; just as at Oxford and Cambridge to-day it is the arts which are taught, and the degree of B. A. is the real sign of the work which they are doing; while at Berlin or Leipsic the degree of B. A. symbolizes nothing that they are doing. The degrees of a German university are doctors of philosophy, theology, law and medicine. The character of the university has varied according to circumstances, and the demand of the age, and the necessities of the nation. Its history will not inform us exactly what a university is, but its history will teach us much about the order of education, and how we may meet the wants of our age and nation.

The university is a growth and not a creation. It is the product of the civilization of the nation. Such was the University of Paris. There was a demand in the beginning of the thirteenth century, which did not exist in the reign of Charlemagne. It was the outgrowth of that age, when the foundation of the study of the arts was laid. The State was gaining power and was in one sense rising above the church — was throwing off the shackles of ecclesiactical

power under which it had been groaning. It was this that brought the arts into greater importance. The study of the civil law was also revived in the breaking up of the old empire idea, and in the rising of the *nation* into importance. It was the state of the world which brought into being the university, and it was natural that the arts, the liberal arts which precede professional study, should be the first to gain a place and to give character to the institution; and it was equally natural that the faculties of theology, law and medicine should follow.

The definition of a university used to be an institution which combined the three faculties. The arts had been dropped and consigned to an institution preparing the student for entrance to the university. But there has been developed in the present century the fourth faculty, that of philosophy. This is another sign of growth. The splendid discoveries of the inductive philosophy of the last, and especially the present century, have made a new department necessary. The university idea was, therefore, enlarged.

The image of the university which comes up before the mind is an institution in which the scientific achievements of the age have the place in the curriculum which they have gained for themselves. The priest, the lawyer and the physician study in the faculty of their respective professions that they may be able to perform the functions of their office. The scientist also has his function to-day. Telegraphs, railroads, ocean steamers, photographs, steam and electricity, heat and light, the minerals of the earth, must make a special subject of study and investigation, as well as law and medicine. It is necessary to know how to take advantage of the forces of nature and apply them to the use of man. Law and medicine and theology have not lost their place. They have not been depressed by any discoveries which have been made in nature, but rather they have been exalted into greater importance. But science has come to take a place by the side of them. The university has acknowledged this. There is a new faculty on the programme of study and a new class of professors. It is acknowledged at Leipsic and Berlin and at the Yale Scientific School and the Columbia School of Mines; at Stevens' Scientific School and Troy Polytechnic School. This faculty and these schools have come into being as a necessary product of the age. They are a development of our progress.

As the wealth and taste of a nation develop there is the increased attention given to polite literature. We become more interested in the history of our race, and the feeling of kinship is more largely produced. This leads to the study of language and many departments of knowledge which pertain to the nature of man. The study is embraced in the same faculty of philosophy. While this is not a product of our age, the progress of our age has called greater attention to the subject and demands more profound study of the subject, and there is, in consequence, made a place for it in our university instruction which could not be embraced in the course of study of a college.

These studies are what the age demands; they are the expression of its wants; they are the symbol of the thoughts, of the life, of the common perceptions of the nation. Education, training, instruction is the means to an end in the nation, and the inquiry is what that end is? What does the state of the age — of the civilization — demand? Education is not a sentiment. We are not educated in obedience to a demand — merely for the appearance. We are not educated simply because the English and the Germans are educated; simply because it is very respectable to be educated; simply because it gives us a standing among the nations, or among individuals of our own people; but we are educated for a purpose — to accomplish an end; to gain a point; to be able to arrive at a certain position. It is this which ever inspires education and inspires us to attain knowledge. We have a purpose in view, and it is this alone which insures success. The study of metaphysics is a pursuit only to those who have an interest or purpose to understand the operations of their own minds and the relations in which they stand to other beings.

The universities of Scotland meet the wants of that nation. They help to develop and to bring into conscious operation the very principles which give them their character and make them to be the people that they are. The same is true in a still higher degree of the English universities. Oxford and Cambridge give tone and character to the English nation. They have nourished and perpetuated that aristocratic feeling and tone which make the English nation. The development of industrial interests in England; the acquirements of wealth and position by a new class of the people; the political importance into which they have risen have exerted an influence on the character of the education. The erection of the University of Durham did not meet the demand; the still later erection into the Victoria University of the Owens' College at Manchester has not satisfied the industrial part of the English people. They have laid their hands on Oxford and Cambridge. They have destroyed the supreme influence of the church and have given the death-blow to that nursery of aristocracy and hereditary right. The Oxford and Cambridge man for the future will have to stand more on his real and personal worth. The classics and mathematics have lost the exalted place which they have held for centuries, and the natural sciences, which deal with material interests and which bring the lower orders of society not only to the surface but into positions of importance, will receive attention and will be rewarded with all the marks of distinction which have heretofore been bestowed on Latin, Greek and mathematics. The university changes with the change of sentiment in the community. It is a creation of that sentiment. It is not an imitation. It is the outgrowth of a condition; of a point reached in the nation's progress; of a want which only the university can fill. The same, no doubt, is true of Germany. The German University is a part of a system. It is the institution through which a person has to pass in order to reach a position on which he has fixed his attention. There is no other

road to that position; there is no other mode by which to attain public employment. The disappointed aspirants must fall into a mode of life which may not be congenial with the culture which the university has given.

The nation makes the university, and the university, I suspect, will always come up to the demand. It will give the culture and furnish the information which the state of society in the nation demands. No doubt there will in many respects be a reciprocal influence, and the cultured portion of the community will show the necessity of higher education, so that the existence of the university will render the university the more necessary.

There was a proposition a few months ago to establish in the west a German university, possibly for those citizens of the Union who are Germans by birth or by descent. But for us a German university would be an exotic, and would possibly thrive like most exotics in an uncongenial soil. A great Washington university would probably be about as successful. Being in Washington would certainly not add to its success, or give to the subjects, in which it would furnish instruction, any more interest, or add to the powers of the student to comprehend the subject. No doubt when the Germans become so numerous that they shall form a distinct part of the nation, or when they wish to isolate themselves so far from the general sentiment of the nation that they may maintain the feelings and views of the fatherland, the proposed institution will take root and grow, but not before. And no doubt also when all sectional feeling shall have evaporated, and there shall be no North and no South, no East and no West, when the State boundaries shall have been annihilated, and there will be no New York and no South Carolina, we may see the great Washington university, but probably not before.

I think that all this is obvious because, as we see from the history of the past and from the present which is making a history, that universities are not made to order, but that they are growths — offsprings of the times — institutions to meet the wants and the demands of the nation and of the day.

The American university is already planted and will grow and bear its fruit. It is not like the university of Scotland, or England, or France, or Germany. But then it is to be remembered that the university of any one of those nations is not like that of any one of the remaining three. It may resemble features of each of them, but it has a character which belongs peculiarly to itself. For instance, the University of France has its faculties of law and of medicine in different cities of the Republic. It is guided in this by circumstances and by the public wants and demands. And it is this which has in a large measure guided education in this country. Law schools and medical schools and schools of science have different locations; and they differ from any foreign university in being a faculty entirely disconnected with any other institution. This is especially true of our theological schools. They stand by them-

selves. They are distinguished for the ability of their professors, and for the education in divinity which they give. No such theological education is given at the universities of Oxford or Cambridge, as is given say at the General Theological Seminary of the Episcopal Church, or at the Union Theological Seminary of the Presbyterian Church in New York. In Germany or in France the faculty of such a school would be attached to an institution in which the other faculties were also established. The question is whether the combination of these faculties in one corporation, in one academic body, will give them more weight, will enable them to give better theological instruction. The same is true of the law school. They also have had a separate and independent existence. The medical school has also an independent and unattached faculty, that is, a faculty which is not attached to a corporation which combines the four faculties. At the present time this is probably more especially true of the scientific school. There is a number of such schools entirely independent, with the power of giving degrees in the subjects which they teach. No doubt in the course of a few years these scientific schools will be attached to colleges as is the school of mines at Columbia, and the Sheffield school at Yale College. This shows the growth in this country of the university idea. The institution, which is already established, and possibly began its existence simply as an undergraduate college, may be slow to admit the claims of other faculties besides that of the arts; but such institutions have admitted it and will continue to do so as there arises in this country the demand for this higher education — or rather for education in these special departments.

We see evidence of this growth in the law school. I have observed within the past few years that the study of the civil law has been revived, and there are now lectures on the institutes of Justinian and on the Pandects. It shows the progress of legal education — that the lawyer is going more into principles — more into the foundations on which all law must rest — more into the ethical nature of law. This beginning will make progress. Although to day our students are not prepared to spend months in the study of the Roman law as a German student would in a German university, yet he will do so just as soon as he finds it profitable or it gives him a more respectable standing in his profession.

The same is true in theology. That the study of natural science has called forth doubts in regard to the Bible account of the Creation and of the government of the world will cause the establishment of professorships in our theological schools on science in relation to revealed religion, and which will furnish more profound knowledge of the Bible as a book of mere information. The theological student of to-day must know more of the science of his religion, and be ready to meet objections which were not made a few years ago. He must have a more clear knowledge and more pronounced opinions of the Bible, and must study it with more care and from different points of view. That there is this need will call for an enlargement

of the course of lectures; new subjects must be introduced and pressed upon the attention of the student. It is the circumstances of the times — the needs of the day, that will make this enlargement a necessity. It is a growth. It is the development of human intelligence brought to bear on the revelation of God once for all made to His church, but applicable to all times and all conditions. The same is taking place in our medical schools. They are not stationary. Their course of study is to-day much more extensive than it was a few years ago. Men who enter on the study of this profession know that not only is a preliminary education necessary, not only must they bring to the study of medicine a trained and cultivated mind, but that they must also understand profoundly the human body, its physiology and its anatomy, and also the relations of the mind to the body, and its influence on the body. The physician can no longer be a mere mechanic — a mere quack with his specifics to meet every case, but he must understand profoundly the human body and the mode of counteracting its ills, and the manner of bringing it back to its normal condition. The medical schools are appreciating this, and enlarging their course, and increasing the severity of their examinations.

But the university has probably shown its progress more in the subject of philosophy than in any others. The faculty of philosophy is a recent creation in a German university. And possibly when the university is named the subject of philosophy comes before the mind more distinctly than another. We think more, probably, in this country of the studies which are classed under this head, and have come to think of a university more especially in this connection. There is really no reason why we should do so. The three faculties of theology, law and medicine still hold the important place in the affairs of life, and must engage the attention of the educated more than philosophy in any of its departments. It is those faculties still which constitute the university, and the institution which has them will maintain the university standing.

But what are our American institutions doing for the cultivation of philosophy? How far has this faculty developed in this country? I have lying before me the course of lectures of the faculty of philosophy in the University of Berlin. I find many of those lectures on chemistry in all its branches, on geology, botany, chrystallography, mineralogy, mechanics and astronomy; on languages, such as Latin, Greek, Turkish, Chaldee; metaphysics and moral philosophy, political economy, history. This almost exhausts the list. If we should eliminate from this list those which are taught in the universities of this country we should find that the remainder contained very few. Possibly if we take up the programme of lectures just put forth by the Johns-Hopkins University we shall find the remainder really reduced to nothing. I do not suppose, as I have already said, that we shall find the same number of lecturers on most subjects in our institutions as we should in the University of Berlin. For instance, a young man holding a temporary lectureship in one of our

divinity schools, told me that the subjects on which he lectured occupied thirteen professors in the German university which he attended. And the same, no doubt, is true of most subjects — in philosophy as well as in theology, no doubt every subject is most thoroughly treated.

In an English university it seems to be presumed that a student who has graduated Bachelor of Arts is capable of conducting a course of study for himself — that all that he then wants is the library where he can find the information that he seeks; that being an educated man he has the capacity of obtaining the information, and investigating the subject and writing on it, and enlightening the world on it — that in science he is capable of conducting investigations and learning from his own observations and experiments. A German university is a labor-saving machine. It would appear that one has only to listen and to remember; that every subject is there so luminously treated that even further reading is excluded, or is unnecessary. Voluminous notes take the place of investigations and study. Possibly the German will be the more learned man, and the Englishman the better developed man, more ready for emergencies, more able to bring the power of his mind to bear on the subject which he chooses, or which demands his attention.

The Johns-Hopkins Institution does not come up to the true idea of a university, for it has not the faculties of law, theology, or medicine, but only the faculty of philosophy. And it, therefore, stands before the country in the same way that an independent law school or a theological seminary does. But the programme which it sends out undoubtedly supplements many other institutions in the country. Its course of lectures covers the same ground as that of the faculty of philosophy at Berlin. And a graduate of any of our colleges may find there the information which is sought in a German institution.

We have, therefore, the university in this country, though in a form different from that of Scotland, England or Germany. But as the university in these countries is a growth, has arisen out of their needs and wants, so has our university; and no doubt like every institution in this developing and growing country our university idea will enlarge, and our universities will expand, and furnish the information which is sought. They will have their distinguished lecturers in every department of human learning. They will have them just as soon as there is a demand for them. The university idea will develop and grow, but it will not be forced. Money cannot create it. It may build the lecture-rooms and furnish the libraries and fee the professors, but it cannot buy the student. If we get ahead of the demands of the circumstances which will bring the students together, we shall have a grumbling public that there are only a hundred listeners where they had made provision for a thousand. Such a cry is already heard in our country.

Professor MARTIN, of New York — Mr. Chancellor: I can only

concur in his substantial course of reasoning with Dr. Fairbairn. I have no question but that is of a substantial character, and I wish to say on this subject that it is an important distinction in regard to our system of education. There is, perhaps, nothing so characteristic of our American educational system as the college.

It has, as Dr. Fairbairn observed, taken its growth in the main and been modeled after the colleges of Europe; and all our customs originally are from Cambridge — the mother college. These institutions have been our models. Yet under the circumstances, these English institutions have not from the very earliest to the latest possessed a system of education which has been capable of adapting itself to the wants and interests of our time. Now in every system of education there must be two main factors; there must be a general education and there must be a fine education in a specific department. In that respect, perhaps, a great many have the very fallacious and injurious idea found in such a saying as "any man can learn any thing." The minds are not prepared to learn every thing if they lack the preliminary education which in a great many ways is overlooked, and by which a man is to be prepared for the more advanced courses of study and entry into the higher branches of English literature. Several years ago, I came across an elegant publication beautifully printed and engraved, written by a young Scotch amateur geologist. It had several very fine illustrations of fossils which the doctor had discovered; and the book was filled with various other illustrations. The name of his first discovered fossil — a name which I suppose was most familiar to him — was the Victoria Alberta. His other fossils he named Victoria Alberta Maximum, and Victoria Alberta Minimum. The book was prepared with great elaboration and with great elegance, and the volume, although admirable otherwise, simply provoked laughter and contempt wherever it went.

Now, there are certain fundamental principles which a man must learn and then he prizes knowledge without having bought knowledge. What sort of a structure would that be which only looked to the measurement of its height and not its breadth and base? Now our colleges are designed to give a comprehensive education to the body of our educated youth, and that idea ought to be cherished and inculcated by every educated man. We want the schools of our country to impart a higher culture and a more thorough knowledge of the various branches of education and science. I think our universities are among the best in the world.

POST-GRADUATE DEGREES.

By Professor C. W. BENNETT, of Syracuse University.

I. PRELIMINARY CONSIDERATIONS.

With regard to the legitimate function of the college or the university educators are not yet in harmony.

This subject is to-day, after so many years, under debate.

That these two terms, "college" and "university," should express different concepts, all alike concede; that they do not is well known.

Some chartered colleges are doing genuine university work; while some chartered universities are doing no more than college work.

Of this state of things we are not too seriously to complain. The older life and richer endowments of some of our colleges have enabled them to do more than they had originally supposed possible; while the broader views and greater hopefulness of some younger institutions have led them to secure charter names and provisions whose implied promises can be fulfilled only in the nearer or more remote future.

While we may thus differ in opinion with respect to our *ideal* university, we do know what these existing institutions profess to do, and we are fully agreed with regard to some of their

FUNCTIONS.

These are of three general kinds, viz.:

1. They have the function of teaching or instruction.
2. They are corporations for supervision of studies, for examination and for awarding honors or degrees, based on examinations.
3. They may combine both these functions.

Of the first class may be instanced some of the colleges of Great Britain and Ireland, and some universities of Germany, who give instruction, but do not grant degrees in their own right.

Of the second class is notably the University of London, which gives no instruction, but examines candidates for the degree of doctor in medicine from more than one hundred different institutions in Great Britain and Ireland, Canada, Australia, Malta, Ceylon, Bengal, Bombay and Madras; and for other degrees those from more than eighty different colleges in the entire dominion. It does not grant degrees in divinity.

Of the third class are most of the colleges and universities of this country, of England, Scotland and Ireland, and most of the continental universities outside of France.

We are all agreed, I think, that all these educational establishments should be stimulating bodies; not only in the way of arousing those who are immediately and directly gathered under their control in some particular spot, but in quickening and encouraging study and search throughout the entire community. The sad lack

in the time-honored universities of England has been that they are exclusive, limited in the scope of their influence, and have failed to stimulate and help the English public. We fear that the same charge might justly lie against some of our most munificently equipped American colleges and universities.

II. DEGREES — THEIR OBJECT AND SIGNIFICANCE.

a. These should stimulate to good scholarship. They should be largely of the nature of the oaken chaplet, or the crown of laurel or bay that was placed on the brow of the successful champions in the ancient games. High honor should be a vastly more powerful stimulus than moneyed prizes. These latter arouse an unhealthy and bitter rivalry, which are unfavorable alike to the best general scholarship and to the growth of that sympathetic helpfulness that should characterize the liberally educated classes. Moreover, many thoughtful men are becoming convinced that these moneyed helps oftentimes emasculate true manhood by destroying independence, and by ministering to a narrow selfishness.

b. These degrees should encourage methodical work. The tendency of most men when they leave college is to neglect their scholastic pursuits. Plunging into the professions, or into business, or entering upon a political career, most men either become purely technical in their studies, or fall into those habits of desultory reading that are so fatal to vigorous thinking and to sound learning.

Could our universities and colleges furnish these men with a variety of methodical and sound courses of reading and investigation, and on their thorough mastery should honor them with an appropriate degree, we believe one chief function of the university would be realized. How to keep alive in business and professional men a truly healthful scholastic spirit is one of the important problems that these higher institutions are called upon to solve.

c. These degrees should produce and strengthen the true university idea. The American people must be made to see more clearly than many now see that the university is not a spot in a certain city or town — not a mass of buildings — not a massive quadrangle of edifices and gardens and lawns, but a community of earnest scholars intent on knowing the truth. The University of the State of New York had this as its original inspiring thought, and this convocation is an attempt to embody this thought. We should remember that there are more honest, intellectual toilers outside the universities and colleges than inside their walls, and it should be the aim of these higher institutions to encourage this brotherhood of workers — by stimulating and guiding as far as possible, and by sympathetic helpfulness in methodical work, and by honoring this work by thorough, proper recognition in the form of degrees. I think that this is among the great needs of American scholarship to-day.

When a graduating class appears on our commencement occasions, it is generally dismissed into the great world just as though scholastic

work was now forever over, and they must turn their back upon the university to seek an entirely foreign field of labor. Rather should it be the duty of the university and college on these occasions to welcome those who have passed their trial period honorably, into the fraternity of scholars, and make them to feel that they are now to become parts of a grander brotherhood. That instead of bidding adieu to study and investigation, to enter upon a career that is not consonant with scholarly tastes and pursuits, they are now for the first time ready for the best work of their lives.

I think of no place where this university idea is more clearly expressed, and the stimulating and honoring function better described than by Victoria in the preamble to the amended charter of the London University in 1863. She says: "Deeming it to be the duty of our royal office, for the advancement of religion and morality, and the promotion of useful knowledge, to hold forth to all classes and denominations of our faithful subjects, without any distinction whatever, an encouragement for pursuing a regular liberal course of education; and considering that many persons do prosecute and complete their studies, both in the United Kingdom and elsewhere, to whom it is expedient that there should be offered such facilities, and on whom it is just that there should be conferred such distinctions and regard as may incline them to persevere in these laudable pursuits — that for the purpose of ascertaining, by means of examination, the persons who have acquired proficiency in literature, science, art, and other departments of knowledge, by the pursuit of such course of education, and of rewarding them by academical degrees, and certificates of proficiency as evidence of their respective attainments, and rewards of honor proportioned thereto, therefore we do, etc., constitute, etc." It is on those who do the work, and show this by proper examination — no matter where this work may have been done — that this reward or honor is bestowed. Professor James Bryce, in a recent number of the *Fortnightly Review*, makes severe complaint of the two venerable universities — Oxford and Cambridge — for their failure to inculcate this idea of a community of scholarship and scholars, and expresses his earnest wish that this painful lack may soon be supplied. We in America are just beginning to cultivate and encourage this spirit. "The American school of classical studies at Athens," under Professor Goodwin, and supported by an association of American colleges (8), is an example of this broader spirit. Boston University, by permitting students of her school of all sciences to spend their last year either at the University of Greece at Athens, or at the Royal University at Rome, and yet conferring on them her own degrees, has taken a step in the right direction. This is but imitating the methods of the German Universities in having archæological and art institutes in Rome and Athens, and a hospice at Jerusalem, where her scholars can pursue their studies at the best advantage and at the lowest rate. The university bond is so strong as to hold together most sympathetically these widely-scattered workers.

III.

Having thus ascertained the desirable ends to be gained by university and college degrees, how may these be best practically secured? This is the question for scholarly and thoughtful men to answer, and it is not to be left to the clamor of the selfish and uninformed.

Three ways are open:

a. By pursuing post-graduate work at a seat of an university or college under professional guidance, or "in residence," as we sometimes say.

b. By home study, in pursuit of a course of reading or investigation pretty carefully mapped out, the candidate receiving suggestions through correspondence, etc., and appearing at the seat of the institution for annual or biennial examinations.

c. By combining these two — requiring one-half the time in residence and permitting one-half to be spent elsewhere. Each of these methods requires examinations, either at the seat of the college or university, or appoints examiners to meet candidates at stated times and places.

Each of these methods has its advantages that are not unimportant.

The first is, on many accounts, best in so far as opportunities for completest work may be concerned. To be where libraries, museums, laboratoriès, cabinets and living advisers are enjoyed is, *per se*, of immense value. Presumably, work under such circumstances would be superior.

The second has also its points of excellence. It may have more flexibility. It would allow of that quiet, thoughtful, more reflective mood that is often more favorable to superior and original work than "residence." When men are "in residence" they propose a definite amount of work for a given time, and this must be done in order to compass the course in that given time.

There is thus a greater temptation to *cram* for examinations. Whereas a non-resident, pursuing his chosen avocation, is more restful and possessed — more inclined to do the work for the work's sake rather than for the sake of the degree. Again, while very few, comparatively, would be able to become "resident" students for post-graduate study and degrees — owing to the expense and inability to turn aside from their professions or their business — the second would stimulate a far greater number to pursue courses of methodical study, even though a one year's course, leading to a master's degree, or a two years' course, leading to the doctorate in philosophy, might require men busy with their daily avocations three, or even six, years to compass. This longer time for meditation and this slower process might, and generally would, contribute to soundness and solidity of attainment.

The third has excellences that will immediately suggest themselves.

IV.

What degrees should be attainable on examination and what conditions should be imposed?

This question is answered very differently in different countries and by various institutions of America.

Doubtless many of our modern methods are tinctured with mediævalism to an extent little dreamed of by many. The degrees (post-graduate) most commonly conferred in this country on examination are A. M., M. S., M. Ph. and Ph. D. In a few instances the M. L., or Master of Laws, and the D. C. L., Doctor of Civil Law, has been conferred on examination. (Boston University.)

In Germany the A. M. has fallen into disuse, the Ph. D. being now used in the "Faculty of Philosophy," which corresponds to our "Arts."

The use of this degree of Ph. D. in this country makes it interesting and appropriate to know how it compares in dignity and as a mark of solid attainments with the same degree in Germany. This degree is conferred by about twenty universities in Germany after six semesters of residence (three academic years), a certain number of courses of lectures passed, and the preparation and defense of a thesis which gives evidence of some original investigation. To compare these requirements with those of an American college or university it is necessary to remember that students in Germany are certificated from the gymnasia to the universities — and that a certificate from any gymnasium is good in any university.

By a careful comparison of the curriculum of study in a German gymnasium with that of the under-graduate courses of the better American colleges and universities, it will be found that a completed gymnasial course is equal to the American under-graduate course up to about the third term of the junior year. The German gymnasium would generally represent more in the department of language, the American college more in science, mathematics, etc.

Therefore the German student enters the university as a last-term American junior. The university student in Germany obtains his Ph. D. in three years. To have the *time* of the American student equal the time of the German student when he obtains his degree, post-graduate studies must be continued about two years. If the course is equally extended, and the examinations equally rigid, a post-graduate course of two years in the better American colleges would represent an amount and a thoroughness of work equal to that of the German student who is honored with the doctorate in philosophy.

Thus we have determined all the elements that are determinable. As to the A. M. degree, this having fallen away in Germany, but being still continued in Great Britain and Ireland, it is important to institute like comparisons as in case of the German gymnasium and university. It is somewhat more difficult to make this comparison. The difficulty lies somewhat in the difference of training in the preparatory schools of England and of America.

The thorough drill given in such great schools as Rugby, Eton, Harrow, etc., puts their students at a great advantage over the generality of students who enter our American colleges.

Dr. McCosh, of Princeton, has often made the most evidently just remark: "The great lack of the American educational system is in her secondary schools." Yet on making the best comparison which I am able I am persuaded that the requirements for obtaining the ordinary A. B. in Oxford and Cambridge are scarcely as full as are made by our best American colleges. This would apply to more than two-thirds of all the students of these great educational centers. Prof. Bryce says of this class: "As for those who take what are called the pass or poll courses, the university does not seriously attempt to educate them. They are worried with examinations and lectures, not so much with a view to their mental benefit as to prevent the evils which unchecked idleness would involve; and they look upon examinations and lectures as disagreeable interruptions to those amusements which are for them the real business of university life." (See *Fortnightly Review*, March, 1883, pp. 29, 30.)

This a sorry picture drawn by a lover of the universities. The truth is that less than one-third of the under-graduates of Oxford and Cambridge can be said to study; and these are striving for honor-degrees and fellowships.

Yet an A. B. of Cambridge University obtains his A. M. in three years without examination. In London University one is not eligible to the A. M. until the expiration of one academic year from obtaining the A. B., and after completing his twentieth year, and then passing a prescribed examination. In Edinburgh and Glasgow four years at the university are required.

One conclusion reached then is that an A. M. granted to an A. B. of our American colleges after one year of vigorous study and examination on the prescribed course would fully equal the M. A. of the London University.

And this seems to be all we should aim at in post-graduate degrees, viz.: that it shall be an evidence and testimonial of work done — which work shall be as nearly as possible equivalent in the entire community of scholars at home and abroad.

The standard must not be so low as to make these honors cheap and contemptible; nor yet so high as to discourage honest and faithful workers, and make a mere aristocracy of scholars, titled literary noblemen. I am inclined to think that one year of honest, faithful, post-graduate work in prescribed courses should lead to the degree of A. M.; and that having gained this degree on examination, another year of good, sound work proved on careful examination should entitle the candidate to the degree of doctor in philosophy.

The question whether other degrees, as D. D., L. M., D. C. L., LL. D., etc., should also be conferred on candidates after the faithful mastery of a prescribed course of study, and on the attainment of a certain age, and stability and dignity of character, is awakening considerable interest. These having been hitherto, for the most

part, regarded as professional or as honorary, little attempt has been made to arrange methodical courses leading to their bestowment.

It is quite common to grant the degree L. B. at the end of prescribed course in our law departments, as it is to give D. B. in our divinity schools. But L. M., L. D., D. C. L., and D. D. are almost without exception in this country *honoris causa.*

Boston University is the only institution in this country with which I am acquainted (there may be several others); that gives the L. M. two years after receiving the L. B. — these two years being spent in a course of prescribed study — and after two more years of dictated study and a careful examination confers the degree of D. C. L.

In London University candidates for L. B. must either be A. B.'s or pass a matriculation examination. Candidates for L. B. pass two examinations, but no one can be admitted to the second examination for L. B. within two academic years of his passing the first L. B. examinations.

No candidate is eligible to the degree of L. D. until he shall have passed his second examination for L. B., and no candidate under thirty years of age can be admitted to this examination until after the expiration of two academic years from the time of his obtaining the degree of L. B.

In Cambridge an L. B. may become an L. M. in three years; and L. M.'s of five years' standing may become L. D.'s on preparing and defending a thesis on an approved subject.

In Glasgow and Edinburgh the LL. D. is *honoris causa tantum.*

Now can there be any solid and sufficient reason why these higher degrees might not be made eligible on proper qualifications ascertained by examinations, and the possession by the candidate of an age, experience and service that would insure dignity of character?

How these examinations for post-graduate degrees should be had — whether by an uniform board, or by the various college and university authorities, we have not time to discuss. This is an unimportant question except as it has reference to amount and thoroughness of work done.

I believe Syracuse University was the first institution in New York to introduce the plan of granting post-graduate degrees to *non-residents* on passing approved examinations in prescribed courses of study.

Regular graduates of reputable colleges are admitted to the degree M. A. after one such year's study and examination; and on one additional year of such prescribed work and examination the candidate is entitled to the degree of doctor in philosophy.

We have conferred the degree Ph. D. on but two men *honoris causa*, the forty others have received this degree on the conditions above indicated. They represent graduates of Genesee and Syracuse, Wesleyan University, Yale, Alleghany College, Illinois Industrial University, McGill College, Victoria University, Columbia College, Waynesboro University, University of Pennsylvania, Cor-

nell University, Michigan University, University of Wisconsin, University of Rochester, and Hamilton College.

The plan has worked well, and I am sure that it has been the means of great intellectual stimulus throughout the country. We have now some twenty-five candidates in half as many States and territories, with whom we are in close correspondence and sympathy and whose studies we are directing. Some have accomplished the prescribed two years' course in less time, while the great majority toil on from three to six years — keeping their leisure hours well occupied with this post-graduate work.

The men on whom we have conferred the Ph. D. have averaged more than thirty-two years of age, and represent all the professions and a few are in business pursuits.

UNIVERSITY NECROLOGY.

Report of the Committee, by D. J. PRATT, Ph. D., Chairman.

During the past year, as during every other year, not a few of those who have served the cause of advanced education in this State have ceased from their benefactions and labors and entered upon the final rewards of their stewardship. Some of these, though perhaps as worthy as any others of memorial tributes, will not be so much as mentioned here to-day; a few, whose names and deeds are, though perhaps only by accident, better known to us or more conspicuous, will engage our brief attention.

The list of the dead for the past year includes among others:

Peter Cooper, Professor Charles Avery, Professor Henry Draper, Bishop Jesse T. Peck, Professor Joseph S. St. John, Principal Henry A. Pierce, Professor Thomas Spencer Lloyd, Mrs. B. N. Martin, Hon. John Newton Hungerford, Mrs. John H. Willard, Professor Charles E. Anthon, College of City of New York, Professor J. B. Thomson, LL. D., Dr. H. B. Wilbur.

To this list there would be some propriety in adding the names of Ex-Governor Morgan, an *ex-officio* Regent, and a liberal benefactor of collegiate and theological education in his native and his adopted State.

President Chadbourne, editor-in-chief of "The Public Service of the State of New York," a superb work of four quarto volumes, the third of which embodies the most extended and complete exhibit of education in this State anywhere to be found.

PETER COOPER.

The name of Peter Cooper long ago became probably more widely known than that of any other private citizen of the State; and nothing that might here and now be said could add to his fame or to the respect which his philanthropy has universally commanded. It is not for his sake but rather for us, his survivors and for those who are to come after us, that his name is formally inscribed on the tablets of the University of the State of New York. This university did not, unless in a very indirect way, aid him; but he, by founding and supporting one of its unique and most popularly useful institutions, has helped to make the university, and the university has long been proud to claim him as one of her most liberal and worthy patrons; and has also, through the Board of

Regents, adopted him as an alumnus, by conferring upon him in 1878, with special formality, its most ancient honorary degree, that of doctor of laws.

The record of Mr. Cooper's long and active life is too extended and already too widely published to either justify or require reproduction here. We, therefore, merely collate a few specimen utterances by the public press, showing the popular estimate of the more salient features of Mr. Cooper's career, and serving to hold him forth as an inspiring example to aspiring youth, however humble and self-reliant, and to those possessors of wealth who have the head and the heart to devote their substance to the educational welfare of their fellow-man.

"Mr. Cooper is much more remarkable for what he has caused to be done in the world than for what he has done himself. The sweet compulsion of his strong will, and yet gentle and persuasive nature, was such that he brought about many things which he could not accomplish himself by any executive or administrative force with which he was gifted. This trait in him is the key to his character and of his great influence in the world. Without learning or even the common discipline of the schools, without the powers of administration which come from regular training, he was the central pivot aronnd which every thing moved within the reach of his influence. * * * Not his hand or his head, but his great *heart*, brought about great results." — Obituary notice in the *Industrial News*, by J. C. Zachos.

"It is pleasant to notice the effect of his munificent generosity as it reacted on himself. In blessing others he was blessed. He was one of the happiest men we have ever known. His goodness shone in his countenance, and the fountain of kindness in his breast was to him the very oil of life; it kept the lamp burning year after year. It is our full belief that he owed the attainment of his great age in large part to his disinterested benevolence. * * * And now he is gone! The dear old patriarch has passed from among us, and the whole city has risen up to do honor to his memory. The poor have lost a friend and a father; the industrial classes have lost their chief benefactor. But the good that he has done will not die. That remains in the thousands who have already shared the fruits of his beneficence, as others will share them for generations to come. The great institution which has been the work of his life will remain his enduring monument." — N. Y. *Evangelist.*

"If Peter Cooper, with his remarkable memory and his keen native intelligence, had merely lived to tell us what he had seen in New York as the great city grew to its present proportions, he would have been a notable character. But it is what he did more than what he was or what he saw that will shed perennial lustre on his name. * * * When he gave to the people that magnificent work he uttered his first and last public explanation of his purpose: Having started in life with naked hands and an honest purpose, I persevered through long years of trial and effort to obtain the means to erect this building, which is now devoted, with its rents and reve-

nues of every name and nature, to the advancement of science and art.

"* * * Peter Cooper's aims were neither petty nor contracted. He entered with hearty zest into many far-reaching enterprises of pith and moment. He was foremost in all movements for the wider dissemination of knowledge. He was an assiduous and delighted student of art, a builder of libraries, and a friend of struggling genius; he had a wise hospitality for every new invention that promised to benefit mankind. With all these admirable qualities he was unselfish, averse to praise and notoriety and gifted with the single-heartedness and simplicity of a child. His kind and loving heart is still. The thoughtful brain that was so fertile in devices for the elevation, enlightenment and amelioration of the condition of his fellow-men has fallen into rest. But the memory and the example of Peter Cooper, the practical philanthropist, the best exponent of a man-loving, God-fearing utilitarian age, survive to inspire and bless unnumbered generations." — N. Y. *Times.*

"His numberless private charities, the overflowing goodness of heart which irradiates all about him, and his sunny and forbearing philosophy of life made him the most loved and venerated citizen of the metropolis. The city has exhibited the outward marks of mourning, public eulogies will be paid to him here and elsewhere, our most distinguished citizens will unite to deplore his loss, yet there will be no sincerer mourners than the thousands, unknown though they may be, who owe to Peter Cooper their education, succor in time of trouble, and the foundation of all their success in life." — N. Y. *Tribune.*

"Peter Cooper held only two offices. He held them when they were places of high municipal honor — alderman and commissioner of education. But truth gives him a titular office that all must admit he filled — president of the workingman's republic!"—*Truth.*

"Mr. Cooper was an 'idealist' in the best sense; he united great insight into external principles and perfect faith in good with his high hopes for man. He will be counted among the 'prophets and the saints of old' by reason of his ever pointing man to what is noblest and most imperishable in him. He never lost faith in the sure coming of that period when man shall realize every high ideal and noble aspiration of his nature; when he shall remove every sorrow and degradation that bows down his sorrow to the dust; when science and art, philosophy and religion shall crown his head with glory and imparadise his earthly habitation; when the visions of the prophet, the dreams of the poet, the aspirations of the philanthropist shall not merely stir the heart of youth and quicken the sluggish pulses of old age, but shall stand realized in the glorious fruition of his imperishable destiny!" — *J. C. Zachos.*

PROFESSOR CHARLES AVERY, LL. D.

By Professor A. G. HOPKINS, Hamilton College.

A life like that of Dr. Charles Avery, connected for thirty-five years with the work of instruction in Hamilton College, deserves more than a passing notice. Dr. Avery was born at Munson, Mass., July 29, 1795. He was the son of Gardner Avery and Amy Newell who, in 1810, removed with their large family to Sauquoit, Oneida county, N. Y. Dr. Avery belonged to a generation which is now fast passing away, when the advantages for education were comparatively rare and were prized in proportion to their scarcity. In the early part of this century these blessings were not brought to every household and almost forced upon every child. In the rural districts the multitude lived a simple primitive life, observant, perhaps, and thoughtful, but with little ambition after a broad knowledge and a thorough mental discipline. Here and there a keen or eager boy aspired after something better; got hold of some books; rose early and sat up late; studying, perhaps, by the flickering light of the fire on the hearth, and finally by a resolute purpose and much self-denial, found his way to the school and college, and so to the avenues of a useful and influential life. In those days learning was the precious metal which was hidden in the veins of the rock. The merchandise of it was better than the merchandise of silver, and the gain thereof than fine gold. This was the spirit which began to stir within the breast of the boy Charles Avery, in the year 1812. Many another boy, born as he was born, might have been content to follow the plow and to care for the flocks all the days of his life, with never a thought or an ambition beyond the boundaries of his father's farm. But this country lad saw at an early day that knowledge was power; that it commanded respect and wielded an influence. He determined to possess that magic power. "At the age of seventeen" he writes, "a new spirit came over my dreams. I found myself at evening solving questions in arithmetic, which had been proposed by young pedagogues as challenges." This was the awakening of that love for mathematical investigations which characterized his entire life — a love to which he gave expression in his old age, when he spoke of "the delightful science of figures." Studying almost at haphazard, and laying hold of whatever came to hand, he next seized upon English grammar. "It was with me by night and by day," he writes. "It followed me into the field, the orchard and the play ground." Then followed the study of Latin and Greek, the former pursued under the Rev. P. V. Bogue, then the acting clergyman at Sauquoit. While in Greek, said he, "I found a very competent instructor in the person of the late George Bristol." He determined to enter college in the fall of 1816. With this in view he studied "from sunrise to sunset." "I longed for knowledge," he said, "as a traveler for cold

water, and I was determined to get it if unremitting industry could secure it." In 1816 he entered Hamilton College, then under its first President, Dr. Azel Backus, whose death occurred shortly after in December 28. His instructors were Dr. Noyes and Professors Norton, Barrows and Strong, for the last of whom especially he conceived a sincere admiration on account of his distinguished ability as a mathematician — an admiration which was afterward deepened into affection through marriage with Dr. Strong's sister. Dr. Avery was graduated from college in 1820. His life naturally divides itself into three distinct portions, viz.: Fourteen years given to academic instruction, thirty-five years as professor of chemistry in Hamilton College and fourteen years of retirement as professor emeritus — years devoted to study and instruction. He had conscientiously devoted himself to the work of a teacher — a work in which he took constant delight, and which he continued in one form or another up to the last year of his life. From 1820 to 1834 he taught in various academies in this State. He was full of energy, thorough in his work, determined to succeed, and in every instance he contributed much to the fame and prosperity of the institutions under his charge.

Among his pupils at Homer, one became afterward the distinguished Judge Harris, another Judge Bosworth of the Supreme Court of this State, and still another, President Joel Bacon. Of his pupils at Fairfield, one was Asa Gray of Harvard, so distinguished in botanical science, and another James Dana of Yale, equally distinguished in geology. At Belleville he worked with no less success, and inspired with an honorable ambition many who afterward became men of prominence and influence. At Fairfield he became favorably known as a mathematician, and, in some instances, students came from Hamilton College to Fairfield to profit by his instruction. From Belleville Dr. Avery removed to Clinton. His object in so doing was in part at least to open a school for the study of the exact sciences. In 1834, while engaged in this enterprise, he was appointed professor of chemistry and natural philosophy in Hamilton College, the only appointment which has ever been made to that double chair. Though a student of science for many years, he wished to come to the new work as well equipped as possible, and the terms of his appointment allowed him to spend the winter of 1834–5 in New Haven, in order to attend the lectures of Professor Silliman. Having taken charge of his department, he threw himself eagerly into the work and in a short time brought that department, which had suffered from neglect, into a respectable prominence. His success particularly in detecting poisons gave him a reputation as an analyst of decided ability, and numerous cases in which questions of medicine and law were involved were brought to him for solution. As a means of stimulating study and research he also conceived the idea of securing permanently endowed prizes. In course of time and as the result of his effort, a new laboratory was provided, a vast improvement

upon the former accommodations for that department, and furnished with conveniences for experimental work by the student. "He introduced into his department for the first time," says Dr. Benjamin W. Dwight, "chemical analysis and agricultural chemistry, and made the chemical equipment of the college, which had been very meager and inadequate, so good as to compare favorably with that of the best endowed colleges of the land."

In addition to the many and varied services which he rendered to the college as an instructor, teaching at times in several different departments, his labors in securing funds for its endowment deserve a special recognition. In three different financial campaigns, he raised by personal effort more than one hundred and thirty thousand dollars ($130,000).

Keenly alive to all matters of experiment or investigation he entered with great zeal into the studies of Daguerre. Dr. Avery took the first daguerreotype ever taken in this country *west of Albany*, and it might be said *west of New York*, since he taught the artist at Albany how the work could be successfully done. It was owing to his experiments in this art, that his health was for a time seriously impaired. In 1844 he was taking daguerreotypes in Rome, N. Y. The operating-room was also used as a lodging-room. The vapors of bromine had so impregnated the air as to make it poisonous, and the sleep of one night resulted in serious and protracted ill-health.

But, perhaps, in no way did Dr. Avery contribute more to the real and permanent good of Hamilton College than in his effort to secure an astronomical observatory.

It was about this time that Professor Mitchel, of Cincinnati, was stirring up the public mind by popular lectures on the subject of astronomy. Chiefly through his own personal efforts the Cincinnati Observatory had been founded in 1845, for which he became director, and in 1859 he took charge of the Dudley Observatory at Albany. Professor Mitchel's activity in this work awakened a wide-spread interest in this noble science. Dr. Avery seized at once upon a thought and project which no one else had dared to entertain. He determined to make a vigorous effort to add practical astronomy to the course, which, up to this time, had been simply theoretical. Dr. Avery and those who labored with him had need to adopt the two resolutions which had governed Mitchel's efforts and to which he said he owed his success, viz.: 1. To work faithfully during all the leisure which could be spared from regular duties. 2. Never to become angry under any provocation, while in the prosecution of this enterprise. In spite of manifold disappointments, hindrance and delays the work was at last completed. It was a curious and interesting coincidence, at last, that the pedestal of granite upon which the telescope is mounted was brought from the quarries of Munson, Mass., the very farm on which Dr. Avery was born. During the year which intervened between the resignation of President Fisher and the inauguration of President Brown, Dr. Avery, by request of the trustees, acted as president of the college, signing all

documents and discharging those various duties which naturally devolve upon its chief executive.

In 1869, having reached the ripe age of seventy-four years, though his mind was clear, his eye undimmed and his natural force unabated, Professor Avery resigned the chair of chemistry in Hamilton College. He felt that the years of arduous and compulsory work might be brought to a close, and that the latter years of his old age might properly be given to less exacting labors. He had no thought, however, of leading an idle life. In 1871 he was elected professor of chemistry and toxicology in the Homœopathic Medical College of the city of New York, and discharged the duties of that office for five years with great success, resigning his post of usefulness and honor in 1876, when 81 years of age. In 1872 he was also appointed professor of chemistry in the Female Homœopathic College of New York city, and gave lectures in both institutions every winter until 1876. As illustrating his vigor and activity, both in mind and body, at this advanced period of life I quote from his journal as follows: "I lectured at nine o'clock to a class numbering from seventy to eighty students, in the college for gentlemen; at eleven o'clock to a class of ladies in the Female Medical College. I also gave lectures in two private schools for young ladies, and made many analyses for poisons, etc., for private individuals. These duties, with many lessons given in the evenings, kept me, as you may well suppose, fully occupied." Another passage from his journal, written with reference to his work in New York, was characteristic of him throughout his entire life: "I never allowed myself to be late at my appointments nor to come to the class-room unprepared."

In February, 1880, he was designated by President Hayes, one of the twelve commissioners to go to Philadelphia and examine the coins struck in the several mints of the United States for 1879, both as to weight and purity. This office he performed with great satisfaction and fidelity, and received together with the other commissioners a medal commemorative of their services.

Dr. Avery was for many years an Associate Fellow of the American Academy of Arts and Sciences, having been elected November 14, 1838. The closing years of his life were spent quietly in Clinton. A green and cheerful old age, free from complaint, full of genial sympathy, was his enviable portion. His mind remained active and clear. At the age of 86, he still found pleasure in reading with younger minds Cæsar and Virgil, or in teaching the elements of mathematics. He even ventured into new fields and dabbled into linguistic studies, and this at an age when no man can master a new language, he loved to pore over vocabularies of the Spanish, Portuguese and Danish. Dr. Avery was familiar with the history of the college from the year 1816. As student or instructor or professor emeritus, he had personally known every president of the college, from Dr. Backus to Dr. Darling. Dr. Avery's mind was characterized by strength and clearness in all logical processes.

He was a close observer and much given to reflection. He was

deliberate and cautious in forming his conclusions and believed nothing so important in accuracy as truth. He was never satisfied with any thing but clearness and exactness in every step of the process as well as in the result. He had a sincere love for the higher mathematics and was unusually able and ingenious in the solution of difficult problems. In all his dealings with men he was characterized by candor and simplicity. He uniformly looked upon the bright side of life. A fund of native humor was always at his command and he loved the pleasantries of social life, which he could well enliven with anecdote and repartee. He was singularly charitable in all his judgments. At peace with the world and at peace with his God, he fell asleep in a good old age, leaving the record of a good and useful life, beloved and lamented by all who knew him.

REV. JESSE T. PECK, D. D., LL. D.

By Regent WARREN.

Rev. Jesse T. Peck began his labors as a teacher and as an academy principal in the year 1837, in connection with a high school at Gouverneur, in this State. This institution, which at that time was receiving only a local patronage, and had but few students, immediately rose to the status of a conference academy under the patronage of the Methodist Episcopal Church, and the number of its students was largely increased. He remained at the head of this institution four years. During this time the building was burned and was rebuilt in good modern style, and the faculty was reinforced by several strong and influential teachers. The rigid inculcation of religious principles was a marked feature in the history of these four years of Principal Peck's administration.

His success at Gouverneur led the trustees of the widely-known Troy Conference Academy, at Poultney, Vt., to secure his services as principal in 1841. He remained in charge of this institution seven years, during which time it enjoyed constant prosperity.

When he was thirty-seven years old he was selected to the presidency of Dickinson College, at Carlisle, Pa., and during the four years of President Peck's administration this college graduated more students than during any four years of its prior history.

Dr. Peck's connection with Syracuse University dates back almost to the incipiency of the movement to found this institution. At the New York State Methodist Convention in February, 1870, which was held largely in the interest of this enterprise, and over which he presided, he made the first subscription of $25,000. This was afterward increased to $50,000, which was, indeed, the entire value of his estate. He was the first president of the board of trustees. His breadth of view, wisdom of purpose, and careful oversight had great influence in determining the plan of the university, in shaping its policy and in controlling its administration. He publicly inducted

into office its first faculty. He laid the cornerstone of its first building August 1, 1871, and inaugurated its first chancellor, Alexander Winchell, February 13, 1873.

He was elected to the Episcopacy in May, 1872. The duties of this office soon compelled his resignation as president of the board of trustees; but until the day of his death he was devoted to the university, took active part in various measures for the promotion of its prosperity, and contributed liberally every year over and above his large subscription for its support.

JOSEPH S. ST. JOHN.

By Prof. W. V. JONES, Albany Normal School.

The duty has been assigned to me to present on this occasion a few facts in the life of the late Prof. Joseph S. St. John, more particularly with reference to his work as a teacher. Although not as widely known or as eminent as some others were whom death has stricken from the roll of teachers during the past year, yet among the hundreds of young men and women whom he taught, and others, who with them have felt the unusual magnetism and kindliness of his presence, there are doubtless many whose grief for him is still fresh, who yet feel sore at heart when they think of his sudden and untimely death. He was born April 30, 1846, at West Milton, Saratoga county. His father, Theodore T. St. John, was a Baptist minister. Joseph was next to the youngest of twelve children, five of whom are now living. When a mere lad he attended school at Ballston Spa, walking there daily, a distance of five or six miles, thus early impelled by that thirst for knowledge, the gratification of which gives so much real happiness and makes "life worth living." He entered the second term of the junior class of the Albany Normal School in February, 1867, and was graduated in June, 1868. After his graduation he taught one year in Scram's Academy at Sand Lake, then for a time he was principal of Rose Union School in Wayne county. After this he taught for about two years in the academy at Highland Falls; and was then called to a position in Claverack College and Hudson River Institute. Here he began to teach the natural sciences. He had previously had no special training for this work, only a short but most thorough course in the Albany Normal School, a course which then did not include any laboratory practice. But by persistent hard work, for which he had a genius, he overcame the difficulties connected with preparing his class experiments. Finding stored away somewhere in the school building an old camera, he went to work with very limited opportunities and soon acquired the art of photography, which was afterward very serviceable to him.

Desiring better to qualify himself to teach natural science, in 1873 he left Claverack and took a special course for one year in the school of mines of Columbia College, New York.

In the summer of 1874, on the resignation of Prof. Cooley, and by his recommendation, St. John was appointed teacher of natural science in the Albany Normal School. Two years afterward he had shown his fitness for the place so well that he was made professor of natural science.

In the spring of 1877 he demonstrated his capacity for original work in his department by discovering a method of photographing on glass, without the use of a camera, thin ground sections of rock fossils — these photographs to be used in projection. A paper descriptive of the process was read by him before the New York Academy of Sciences, November 20, 1877, and was printed in Anthony's Photographic Bulletin of December, 1877.

In the scientific course here special attention was given by Prof. St. John to those subjects that can be most easily taught in the common schools. He succeeded in combining theory and practice so well as to turn out students who were generally well prepared to teach what he had taught them. He was an enthusiastic teacher, and his enthusiasm was contagious. His whole mind was given to his particular department. He had found just the work to which he was best adapted. He sought to popularize the teaching of the natural sciences. To this end many experiments in chemistry and physics were performed with the simplest and cheapest apparatus, in order to show that much science can be taught with only a trifling outlay of money. To enforce this idea in a still more practical manner, the students in their laboratory work in chemistry were required to make the common gases and experiment with them by the use of apparatus purchased by themselves at a cost, exclusive of a cheap zinc tank furnished by the school, of from one dollar to a dollar and a half. A paper on the subject of teaching science in the common schools was prepared by Prof. St. John, to be read before the convocation of last summer, but he was prevented by sickness from being present and reading this paper.

On Monday, Nov. 13, 1882, Professor St. John occupied his chair in the chapel of the school for the last time. On Tuesday morning word came that he was very sick. Soon it was known that his sickness was typhoid fever. On Wednesday of that week before delirium set in, he said to his brother Wallace, "I am a very sick man; will probably die. I know what this disease is. I want to say now while I have my senses that if I should die I shall surely go to Heaven. I am as certain of that as I am of my own existence." On Thursday, Nov. 23, at 5 o'clock, P. M., he entered, we trust, into the glorified presence of the great teacher, forever there to learn of the higher mysteries of life and creation.

From among several appreciative notices of the man and his work, the following two extracts are made, the first from a memorial adopted by the faculty of the Albany Normal School:

"In him high scientific attainments were united with a simple, child-like Christian faith. Thus actuated by the highest motives, he was honest and earnest and faithful in all his work. Himself a

graduate of this school, educated by his own unaided efforts, he was in fullest sympathy with its students; he freely and gladly gave to them his time, his talents, his unselfish devotion, his Christian manhood. He was unremitting as a student, he was successful as a teacher, he was a genial associate, he was a manly man."

The second extract is from a minute adopted by the executive committee of the school:

"The executive committee, having learned with grief the death of Joseph S. St. John, professor of natural science in the Normal School, desire to testify to the great value of the services which he has rendered during his connection with it. He has given for more than eight years his best thought and energy to the work of his department. He has raised it to a high degree of efficiency, and imparted to the students under him a lofty idea of duty, and a firm enthusiasm for scientific investigation. The committee especially refer with gratitude to the efforts of Prof. St. John to render his plan of instruction a practical guide to the students under him in their subsequent careers as teachers of science."

On Sunday afternoon, November 26, the funeral services were held at the Emmanuel Baptist Church, of which he had been a member. The church was filled by the members of the school and many other friends. Very seldom are there seen so many sincere mourners on such an occasion. The last look into the familiar countenance was given through eyes dimmed with tears. Through the fast falling snow the remains were borne away for interment in the Albany Rural Cemetery.

PRINCIPAL HENRY A. PIERCE.

By Superintendent BEATTIE.

Entered into rest, at Lansingburgh, N. Y., December 21, 1882.
HENRY A. PIERCE, Principal of Troy High School.

Perhaps the stern and inexorable record which so briefly chronicles the close of a useful life will be best supplemented by the following words, which have been penned by his co-workers who knew him best, and realized his worth. With slight variation these remarks were printed in a daily paper just after the departure of Mr. Pierce.

The death of Henry Alexander Pierce has caused profound sorrow, not only in our educational circles, but also among the host of personal friends whom he had attracted to himself by his manly virtues. Mr. Pierce was born among the beautiful hills of Berkshire county, Massachusetts, in 1826 He enjoyed the stern and rugged training of farm life and the excellent primary drill of New England common schools. Moved by noble ambition and his innate longing for future usefulness, he began to pave the way to success in his designs, by teaching school, at the age of nineteen years. By

his own unaided energies he accumulated the means by which he supported himself as a student in the famous Williston Seminary, in Massachusetts, long enough to be well prepared for admission to Williams College. He had already earned such reputation as a teacher, that his services were in great demand and he was induced reluctantly to forego his cherished plan of entering college, and resumed his place in the ranks of teachers; but he never ceased to be a student, and his scholarship ranked in due time even beyond that of his more favored schoolmates, who went through college. He soon passed into the ranks of high school teachers, fulfilling his office in Indiana, Michigan and New York. In 1869 he was chosen principal of the Fourth Ward Grammar School in Troy, and in 1872 was elected principal of Troy High School, which position of trust and honor he held until the hour of his departure from this life. Thus briefly recorded stand the outlines of his life. His characteristics as a teacher were intense earnestness, accuracy, conscientious application, and marked ability to arouse the enthusiasm of his pupils in every subject. He despised shams and pretentious display, and with such modesty did he labor, that too few appreciated at its real worth the great work of his life. But the merit of his work became so well known, that Williams College conferred on him in 1866 the honorary degree of master of arts. However much of honor we may concede to him in his chosen occupation, it is well understood by his intimate friends, that in the characters of husband, father, brother, friend and humble Christian, he deserved far greater praise. His funeral took place from the Presbyterian church, in Lansingburgh, on Sunday morning, December 24, 1882, and his body was borne to the tomb by young men from his well loved school. From the heart of every one who knows him arises the plaudit : " Faithful worker, enter into thy rest. Sweetly may thy body sleep until the heavens pass away."

The following tribute is taken from the address of Mr. H. P. Judson, the successor to Mr. Pierce, on presenting the graduating class of 1883, of Troy High School to the school board, at the annual commencement. Mr. Judson was a pupil of Mr. Pierce, as well as his co-laborer.

" In presenting to you for graduation the class of '83 of the high school the first thought which occurs, I think, to all here present, is of him who should have stood in this place, and whose voice for ten years has been heard on these occasions: It is no uncommon experience, in the hurry of life, for us to see one or another drop from his place and disappear. There is a moment's pause. Then the busy crowd close up their ranks and again rush on; and save in the sore memory of a few faithful hearts, it almost seems as if he had not been. And with peculiar force does this apply to one of the profession of the late principal of this school. Others leave behind them tangible results of their activity. The engineer may build a bridge — the architect a stately mansion, and all may come and look upon it. The poet or the historian in his works may ' rear a monument

more enduring than brass,' in which his name is inscribed in unperishable characters. The teacher through his life-time gives to his chosen calling the best work of his heart and brain; and it is gone — dissipated among the invisible, silent forces which move society. The few visible results to which we may point are often those which signify least. The best which the teacher can do is, to accomplish that subtle forming of the intellectual character which may be of unmeasurable moment to the individual, or to society, but which the educator can seldom identify as his own. And this was the life of the one of whom I speak. For more than thirty years he gave his efforts to the cause of education with a rare fidelity, and a rare intelligence. Strong as his native Berkshire hills, simple with the old New England simplicity, he scorned bombast and display, sought merely to do a man's work, thorough and honest. That he did. In the character of hundreds who are yet doing their part in the world, he still lives. And I trust that the thought of him, as they knew him, will make these young men more manly, and these young women more womanly."

THOMAS SPENCER LLOYD.

The *Argus*, April 11, 1883, made mention of the fact that Professor Thomas Spencer Lloyd could live but a few short hours, and that his case had been given up as hopeless by his attending physician, Dr. Lewi, and took occasion to allude to a few of the salient points in his busy and successful career. The hour at which the intelligence of the fatal character of his malady was received, prevented the giving of minute details. Death came to his relief yesterday afternoon at about half-past two o'clock. The following appreciative estimate of the deceased, and his works, contributed recently by that graceful writer and careful historian, Mr. H. P. Phelps, to one of the leading musical papers, will be read with interest:

The artistic life of Thomas Spencer Lloyd, fully written, would, to a great extent, be the musical history of Albany for nearly thirty years. Born at 96 Green street April 10, 1830, and having passed his whole life in this city, Mr. Lloyd was unequivocally an Albanian, but his reputation as a musician, and particularly as a composer, extends from Montreal to Mexico. It was a satisfying thought to him, that in every part of our broad country —

> Where bells have knoll'd to church,

it is through his musical thoughts, expressed by choir and organ, that the devotion of worshiping thousands finds its way to Heaven.

Mr. Lloyd was a musician almost as long as he was any thing; quite as long, we may say, for he must have been born one. His father, though not a professional, had a fine tenor voice and played the flute remarkably well. Thomas read music when only ten years

old, and at twelve sang alto in the Old Brick (the First) Presbyterian Church, with whose choir he was connected, man and boy, for eighteen years. He determined when a mere lad to make music his profession, and in 1844 was clerk in Hidley's music store. As early as 1851 he composed the music to the song "I've Something Sweet to Tell You," which was made popular throughout the country by Mrs. J. H. Long, of Boston, who sang it with great success wherever she appeared. It was published by G. P. Reed, of Boston, and many thousand copies were sold, for all of which Mr. Lloyd was not a penny the richer.

His first appearance as conductor of a chorus was July 4, 1853, at one of the celebrations organized and carried out by the Young Men's Association. The exercises took place in Dr. Huntington's (now Clinton Square Presbyterian) Church, and included a poem by Manton M. Marble, afterward editor of the *World*, and a cantata entitled "The Spirit of '76," words by the late Alfred B. Street. The soloists were Mrs. G. W. Page, T. J. Wallace and James H. Durfee. The chorus numbered about two hundred voices, and their leader, a mere stripling at that time, was highly complimented for the skill with which he first used the baton. In fact, so great was the enthusiasm, that on the strength of this single public performance a musical association was started, with young Lloyd as leader, but for some reason it never resulted in any thing but a few rehearsals, and soon gave up the ghost.

To refer in detail to all the musical enterprises with which Mr. Lloyd was prominently associated would be impossible. We can mention but briefly a few of the most important.

On the last of February, 1859, Mozart's twelfth mass was given in the Methodist Church. The principal soloists were John N. Cutler, tenor; S. W. Whitney and Gen. J. B. Stonehouse, bassos; Miss Jenny Terry (now Mrs. Edward Durant) mezzo soprano; Miss Lillie Brown (now Mrs. Thomas S. Wiles), and Mrs. Serviss, sopranos. There was a chorus of two hundred and fifty voices, an orchestra from Dodsworth's band of New York, and J. A. Reed was the pianist. Mr. Lloyd conducted. So delighted were the audience at the performance, that at its close they resolved themselves into a meeting by making Rev. John N. Campbell, D. D., president, Richard V. De Witt, secretary, and passed resolutions of thanks to the artists and requested a repetition of the mass. As a result of the interest thus awakened in musical matters, the Albany Union Musical Association was organized with Robert L. Johnson as president, and T. Spencer Lloyd as director, the same association, in fact (with the "Union" dropped out of its name), which is now in so flourishing a condition and about to give the oratorio of St. Paul.

When Fourth of July came around again that year, the Young Men's Association celebrated the day with enthusiasm, the exercises taking place in a great tent in the Academy park; A. Oakey Hall, of New York, delivering the oration, and Caleb Lyon, the poem. The music was by the association, which then boasted of a very large and well-trained chorus; Mr. Lloyd, of course, conductor.

The next event was a grand performance on Christmas night of the same year, at the New Arsenal hall (corner of Eagle and Hudson streets), of Mendelssohn's grand old Ninety-fifth psalm; Spohr's "God, Thou Art Great;" Ries' "Morning" by the association, and selections from Mendelssohn, Von Webber and Wallace by Dodsworth's band. This was another unqualified success for the association and Mr. Lloyd. When the great Army Relief bazaar was held in the Academy park, Mr. Lloyd was appointed chairman of the sub-committee on music, and at the opening, on the 22d of February, 1864, a cantata written by Miss Margaret Morgan, and set to music by Mr. Beale, then organist of St. Joseph's Church, was performed under Mr. Lloyd's direction with great *eclat*. This occasion, memorable as it was for many reasons, was so from a musical point of view from the fact that it was then that Emma C. Lajeunesse (Albani) made her *debut* before a miscellaneous audience, as a soloist. It was by accident merely. There had been much search for a singer competent to assume the position; several had been named, but none were available. At length Mr. Beale said he had a little girl in his choir who would do, and she did do, singing the arias allotted her with much of the power and expression which have since won for her a world-wide reputation. She was then scarcely sixteen, a slight, frail creature, and the wonder was, as she stood there, where all the volume of tone came from. It was her first triumph.

During the war the rehearsals of the association were discontinued, and it was not till January 28, 1868, that it awoke from a sleep of nine years, and under the same leader gave, in Tweddle Hall, Handel's war oratorio of Judas Maccabæus, with Miss Lajeunesse in the principal soprano part. Among others who assisted were Mrs. Hoyt, Mrs. Sayles, Miss Emma Weeks, Miss Murray, Miss Cuyler, Messrs. Robinson, Quayle, McLean, Stonehouse and Whitney. This performance was witnessed by one of the largest audiences ever assembled in Tweddle Hall.

April 30th of the same year, Haydn's Seasons was given, and the following winter The Creation and The Messiah, all done by home talent. And here it may be noted that at the time the feeling was against the employment of out-of-town talent. Carl Rosa wanted to bring Parepa here to sing the solos, and the matter was partially negotiated by Mr. Lloyd, but there was so much dissatisfaction with the arrangement that it had to be given up.

Mr. Lloyd's connection with the choirs of the city is well known, his time having been divided between the First Presbyterian, as above mentioned; the Second Presbyterian, under Dr. Sprague and Dr. Upson; the Lutheran Church, and St. Paul's Episcopal.

For thirteen years Mr. Lloyd was musical director in the public schools, visiting every department once in two weeks, and thus, by superintending this important part of the education of the rising generation, left an imprint behind him that will be tracea-

ble long after he has passed away. The songs we sing when we are young, like the selections we read and commit to memory at that period in life, are the last to be forgotten. But it is not children alone that owe their tuition to Mr. Lloyd. Mature pupils of his, who are to-day among the best vocalists in this and other cities, may be numbered by the hundred.

It is, however, as a composer that Mr. Lloyd was best known, especially outside of Albany, and as such in the department of church music he was ranked among the first in the country. A glance at the programme of music for Christmas and Easter, in both the Protestant and Catholic churches of America, will discover his name with pleasing frequency, while not a Sabbath passes but his music is sung by scores of choirs and congregations. The following list of contributions for the church will be of interest:

ANTHEMS.

"Te Deum Laudamus," in E flat.
"Te Deum Laudamus," in B flat, with full orchestral accompaniment.
"Jubilate Deo," in E flat.
"Gloria Patri," in G.
"Benedic anima mea," in B flat.
"Bonum est confiteri," in G.
Easter anthem in B flat, "Christ our Passover."

HYMNS.

"Come, said Jesus' sacred voice."
"Lord, with glowing heart I'd praise thee."
"While shepherds watched their flocks by night."
"To our Redeemer's glorious name."
"As when the weary traveller gains."
"Christ the Lord is risen to-day."
"Softly now the light of day."
"Songs of praise the angels sang."
Easter carol, "The strife is o'er."
Christmas carol, "Ring, merry bells, the Christmas morn."
"Christ risen," soprano solo with cornet and flute accompaniment.
"Pass every earthly joy."

ARRANGEMENTS (FROM OTHER COMPOSERS).

"Te Deum Laudamus," in D, arranged and adopted from Lambilotte.
"Te Deum Laudamus," in A flat, from Zingarelli.
"Te Deum Laudamus," in C, from Sir Michael Costa.
"Benedic anima mea," from Lambilotte.

In addition to the above should be mentioned a hymn for the day of atonement, "Elohenu Velohe Avosenu," tenor solo and chorus,

written for the Jewish service, and a great favorite with that music loving and appreciating people.

As a song and ballad writer Mr. Lloyd has also an enviable reputation, gained in part by the following publications:

SONGS, BALLADS, ETC.

"I've Something Sweet to Tell You," "Memory," "Recollections," "Breathe Low, Thou Gentle Wind," "Nora, My Queen," "Do Tell," "Knickerbocker Boat Song," "Come Again, Happy Days," "Castle Beyond the Town," "For You," "Kittie Neil," "Longings," "Sunshine," "Yes or No," serenade, "The Dews are Falling," "Art Thou Dreaming?" "Rothesay Bay," "My Love Annie," "The Soldier's Song," "Bonnie Bell," "Softly Breezes Gently Nestle."

The following of his compositions have also been published: Alpha Sigma polka, cornet polka, Cavalier schottische, Elena redowa, Troubadour march.

Mr. Lloyd was withal something of a mechanic, having made seven violins with his own hands, and his productions in this line received a silver medal at the State fair.

The last work of importance with which he was occupied was an unproduced comic opera. His attention was directed to this style of music by the great success with which he conducted amateur performances of "Pinafore" and "Trial by Jury" in 1879, and in that year he began the composition of an opera, which was finally given the name of "Pompair." How much work he laid out upon it the public will never know. It has been his pet project for three years, and was completed with the thoroughness characteristic of his labors.

Professor Lloyd was married at Detroit, in 1862, to a daughter of Dr. Henry Puling, who had removed to that place from this city. The widow and two daughters and a son survive him. His home on Elm street was the abode of culture and refinement. His appreciation of the beautiful in art, together with his many noble qualities as a man, won for him the lasting friendship of those with whom it is an honor to be associated. His death is a public loss; but to his family and those who loved him best, it is in its suddenness a calamity under which nothing remains to be done but to extend the hand of sympathy, and raise the prayer for resignation.

MRS. LOUISA C. MARTIN.

By Rev. Dr. S. D. BURCHARD

Although the time of the convocation should not usually be occupied with notices of any persons who have not been directly connected with the work of education, yet the committee have desired me to present a brief memorial of Mrs. Martin, the wife of Pro-

fessor Benjamin N. Martin, who, though never a conspicuous member of this body, has yet attended without fail for the past ten years and has become known to a large number of those who have been present at its sessions.

Mrs. Louisa C. Martin was a native of England, having been born in Liverpool, of American parents, in the first decade of this century. Among her earliest memories was that of the Gladstone mansion, on Rodney street, adjoining her own house, and of the elder brothers of the present Premier of England, with whom she played in childhood. She came to America at the outbreak of the war of 1812, suffering a capture, and then a recapture, from a British vessel, off the Delaware capes. After peace was restored, her father, Mr. Daniel Strobel, went to France and became American Consul at the port of Bordeaux. There she lived for fifteen years — the golden years of youth — surrounded by every advantage of refined society and elegant culture, in the delightful climate and romantic associations of the sunny south of France. She naturally acquired there a kind and degree of refined accomplishment that marked her entire life with its influence and made her different in some respects from the majority of her countrywomen of the same period. But she was a thorough American in heart and in feeling and never experienced or allowed any thing of that shallow and unhappy demoralized spirit that is too often found in those who have lived or been educated abroad.

Her beautiful attainments in art and her familiarity with the best forms of French literature and taste cannot here be dwelt upon. Suffice it to say that she early became a miniature painter of remarkable taste and skill and cultivated that gift with great delight and exquisite success for many years of her life.

On leaving Europe she returned to this country in 1830, passing through one of the most celebrated and destructive cyclones on record, in which the vessel narrowly escaped destruction. For some years she lived in New York, where her father received a position as deputy collector in the Custom House. She subsequently revisited France for a year, returning once more in 1837, and living chiefly in Washington, Philadelphia and New Haven, Connecticut. At the latter place she had already met him whom she afterward married and with whom she passed forty-two years of unbroken domestic affection — a life as nearly ideal in its perfect confidence and beauty as it is given to mortals to enjoy below.

Her husband was settled in the ministry, first in Massachusetts for several years, and then for a time over the Fourth Presbyterian Church of this city (Albany), at which time began her acquaintance with Albany, living here from 1848 to 1852. Since then her home was in New York, as there was her husband's professorship, and, of late years, also her son's, and with both of them she has made the pleasant annual pilgrimage to this gathering since 1873.

Of the private life of one so retired and unassuming, of its virtues and its charms, its love and its devotion, this is not the place to

speak. Her sympathies with the educational work and the professional engagements of her husband and son were very deep and strong and were to them a constant source of comfort and joy. In the trials or the successes of the institutions with which they were connected her interest was most warm and unfailing. So long and so far as her health allowed her home was ever open, and her gracious ministries and hospitalities ever freely given, to the students of both those institutions, in the belief in, and the enjoyment of, those simple and refined forms of social courtesy which are far too little found, we fear, between the faculties and students of many of our colleges.

Mrs. Martin had early acquired an interest in some forms of natural history, particularly conchology and mineralogy; and circumstances had increased her taste in these directions as years passed on. In later life, when her husband and son became largely students of these and kindred branches, she was a sharer in their pursuits with great enjoyment; and for years, in summer travels and excursions, where recreation and science were sought together, she was their constant companion and participant.

In her early life abroad Mrs. Martin had connected herself with the simple communion of the French Protestant Church. She had never been influenced or attracted by the outward forms, or the musical and fashionable accessories, of the worship of the Continent around her. Indeed, this love of earnest simplicity characterized her entire life and was one of the most marked features of her character, the more so, for its association with remarkable delicacy of taste and refinement of sensibility. After her second return to this country, she was for the rest of her life in communion with the Presbyterian or Congregational Church. A quiet, constant and eminently trustful piety animated all her course below and showed itself brightest and clearest when days around were dark. As the end drew nigh she was full of peace, of prayer and of praise.

Her illness, of some four months' duration, was not from any positive disease, but a gradual and painless failing of the whole mortal frame. For a long time her health had been frail, and no serious alarm was felt until very near the end. On the morning of April 3d she suddenly sank into a quiet sleep, then passed into unconsciousness without a pain or a motion, and in a few moments she awoke to "see the King in his beauty and behold the land that is very far off."

JAMES BATES THOMSON, LL. D.

From the N. Y. *Evangelist*, July 5, 1883.

Died in Brooklyn, June 22, JAMES B. THOMSON, LL. D.

To many of the readers of the *Evangelist* the name at the head of this article will recall the memory of a man of kingly presence,

of wide and extensive culture, of great zeal in the cause of education, and of profound and earnest piety. A close student to the end of his days, interesting himself in all departments of science, though with a strong preference for the exact methods and the clear demonstrations of mathematics, he recognized most devoutly and unhesitatingly that the mysteries of Divine grace, and the plans and methods of the glorious scheme of man's redemption, transcended all the problems of human science as far as the heavens were lifted above the earth. While he demanded the most rigid exactitude in mathematical questions, he felt that faith in the Son of God, and in the wisdom, purity and holiness of the Divine nature was infinitely higher than science, and that its exercise lifted the soul into union and communion with Christ.

James Bates Thomson was born in Springfield, Vermont, before the close of the first decade of the present century. His earlier years were spent on his father's farm, with only such advantages of education as were attainable in the district school and the village academy; but so earnest was his love of study and his thirst for knowledge, that at the age of sixteen he had commenced life as a district school teacher, seeking thus to prepare himself for college. To this purpose he clung unwaveringly, and after many hardships and some delay, from a painful affection of the eyes, he entered Yale College in 1830, and graduated with honor in 1834. From 1835 to 1842 he taught an academy of high grade in Nantucket, Mass., and in the latter year removed to Auburn, N. Y., two years after his marriage to the faithful, affectionate and accomplished wife who now so greatly mourns his loss. In Auburn he was engaged, at the urgent request of President Day, in the preparation of an abridgment of his algebra, which was so well and favorably known to the last generation of scholars in our academies as "Thomson's-Day's Algebra." He also engaged with great zeal and success in the organization and conducting of "Teachers' Institutes," which have accomplished so much for improvement in the methods of teaching in our public schools. His remarkable ability in imparting mathematical instruction led to his removal to New York city in 1846, where he prepared a series of mathematical text-books, which under the names of "Thomson's Series of Arithmetics, Algebras, Geometry," etc., won for him a great fame, and which attained to a very large circulation. In 1854 Hamilton College conferred on him the degree of LL. D., and in 1882 the same degree was conferred again by the University of Tennessee. He removed to Brooklyn in 1868, and having changed his publishers, he commenced soon after the preparation of a new mathematical series, in which he determined to embody the latest and most complete improvements in arrangement, methods of instruction and practical application of mathematical processes to commercial use. He was eminently successful in this attempt; far more so, it is no more than fair to say, than any of his numerous competitors. His careful and thorough investigation, often spending days on the wording of a single and

apparently unimportant rule, his anxiety to make every example teach a practical lesson and contribute to a practical advance in knowledge, and his vast fund of mathematical acquirements, constantly increased by study, deserved and won for him a great success. His industry and pluck were amazing. For eight years past he has been a great sufferer from a form of rheumatism which rendered active locomotion impossible; but though often racked with pain his eye was not dimmed, nor his mental force abated; and his daily limit of six hours' labor was performed as regularly, and with as perfect expression of his ideas, as if he had never suffered a pain. His wife and daughter, both excellent mathematicians, rendered him great assistance in the details of his work. He also prepared several other works, and was a large contributor to educational journals.

But we have reserved to the last the traits of his character which were most deserving of record. He was a most loving and devoted husband, father and friend; to know him was to love him. Above all, he was a man of deep and earnest piety. He united with the Congregational Church in Vermont in his youth, and maintained a consistent Christian profession throughout his entire life. Neither the temptations of a college life, the ambition and close application of a successful teacher, the fascinations of a public life, nor any of the thousand attractions which draw so many away from Christ, had any effect on him. The writer is not aware whether he ever thought seriously of entering the ministry, but his whole life was one of active, practical Christianity. To him there was no conflict between Christianity and science; no occasion to fear the assaults of the agnostics. He knew that the plane of the religion of Christ was infinitely higher than that of the scientist. He was a man of prayer, an earnest participant in all church work so far as his health and his means would permit; a devoted friend and helper of his pastors, and a constant student of the Word of God. He met death without fear or regrets, and in full hope of a blessed immortality. "For him, to live was Christ; to die was gain." L. P. B.

Hon. JOHN NEWTON HUNGERFORD.

By Professor EDWARD NORTH, Hamilton College.

Higher education suffers the loss of a generous benefactor in the death of Hon. John Newton Hungerford, a trustee of Hamilton College and Elmira College. Born in Vernon, Oneida county, December 31, 1825, he followed conspicuous examples in that quiet, farming community, when he sought the advantages for study in Hamilton College. He was graduated in 1846, and after a brief business experience in Westfield, he removed to Corning, Steuben county, and there established the Hungerford Banking House. For thirty years there had been no break in his prosperity, and a constant enlarging of his useful activity and influence, when death found him still busy with new plans, April 2, 1883. This was less than eighteen months after his second marriage.

In business ventures Mr. Hungerford was so cautious and conservative that his friends sometimes thought him not fully awake to the largest opportunities. His successes were gained honestly, and with no envy of the prosperity of others. He was a safe, intelligent and patriotic leader in the councils of his political party. When he was elected to the Forty-fifth Congress from the Twenty-ninth New York district, there was confidence with men of all parties that his constituency would be wisely and honorably represented. He kept clear of ambitious attempts at speech-making, but he was watchful of the interests intrusted to his keeping, and his votes were guided by the convictions of upright statesmanship.

Mr. Hungerford well understood the higher uses of wealth. The devising of liberal things for religion and education was never overlooked in the exacting stress of his business undertakings. He held out a helping hand to Auburn Theological Seminary and Elmira College for young ladies. For twelve years a trustee of Hamilton College, he honored this office by his liberal sagacity in council and a loyal devotedness that forgot personal convenience in his desire to promote the institution's growth and usefulness. He cheerfully co-operated with its officers and friends as well by his large benefactions as by his rare example of promptness, courtesy, hopefulness and spotless integrity. The permanent linking of Mr. Hungerford's name with one of the halls of Hamilton College may be interpreted as a symbol of the lasting gratitude of successive classes of students that will enjoy the benefit of what he generously provided.

Rev. H. A. SACKETT.

It seems appropriate that memorial notices of men who have made endeavors in the direction of the great public interests which engage the attention and influence of this honored body should be given in response to its invitation.

A brief sketch of the work and character of Rev. H. A. Sackett is, therefore, respectfully tendered to the convocation.

Those Regents nearly or quite all passed to their reward, who, in the discharge of their responsibilities as guardians of the institutions of learning in our State in 1851–1858 became cognizant of the difficulties attending the enterprise projected and carried forward by Mr. Sackett that gave Elmira Female College to women and the world.

We are apt to lose sight of the difficulties that nearly all advance movements or reforms encounter before reaching a quiet place in the accepted social order. Or, if they are partially estimated, we do not always appreciate the peculiar adaptation of character needed in those raised up by Providence to lead in the various lines of progress, nor the special inspiration of interest, hope and faith they receive, for a further preparation to overcome the obstacles, and often positive antagonisms confronting success.

We may but dimly comprehend the complex ends reached by the divine plans for human good through human agencies and conflicts. Yet we may rest assured of the wisdom, and therefore necessity for the methods employed. We cannot say that a *gradual* progress in knowledge, in the arts, in political and religious liberty is not best. Nor can we know that in our present state, suffering and effort, requiring superhuman aid, is not necessarily antecedent to the most perfect results in attaining the good of men as individuals and as a race.

History shows that ideas underlying theories and practical improvements have been slowly evolved, and when first broached usually regarded with suspicion and resistance. It has made "the conflict of the ages."

The subject of our memorial tribute proved by his experiences as a servant of God in serving the people, the necessity for the innate qualities of patience, capability of will for high resolutions and for perseverance in those called to such responsibilities even in the smaller reforms. His indirect training and the influence of an abiding faith were also made essential. His temperament gave him earnestness and a remarkable power of endurance. The financial misfortunes (so called) of the family fostered habits of industry in worthy pursuits, and self-reliance in overcoming difficulties. The habitual exercise of filial love in all helpful ministries made him regardful for others. The quiet of his surroundings in his childhood, favoring content and thoughtfulness, and a disposition to find interest in facts and study rather than in fiction, developed his power for logical reasoning and for candid investigation of principles and duty.

Thus did Providence, quite unconsciously to himself, fit him to do a work in the two lines of similar importance in which he had need of his powers.

The first was in the gospel ministry at the time the great questions of temperance and of anti-slavery were being agitated; the second was in an educational reform.

In entering upon the second he did not propose to leave the ministry, to which he had most sincerely consecrated his whole being. He had in early life purposed, with all the earnestness of his strong nature, to seek wealth. But his Redeemer had other riches in store for him. His motives and aims became entirely new under new views of the claims of his Heavenly Father upon his heart and life. He yielded to them in full acquiescence. Thenceforth all pursuits were subordinated to, or relinquished for, that of the good of men, as a perpetual offering to God.

For more than ten years he prosecuted his preparatory studies with untiring assiduity. Few men could have spent consecutive nights in close mental labor, while the days were given to toil for self-support. He did it often for months together rather than depend on church assistance, imposing a moral obligation that might interfere with entire freedom to accept a field, irrespective of amount of salary.

He was graduated from the theological department of Yale College in 1835, and soon after licensed by the New Haven Congregational Association.

He prosecuted the duties of his calling for fifteen years, mostly in central and western New York, with the same persistent earnestness that characterized him in preparation for it.

Very few men could bear the strain upon mind and body which his self-abnegation allowed him to impose. In addition to quite extraordinary pastoral work, his sympathy with the reforms of the day led him to contribute, as he could, his influence by his pen and occasional lectures.

It seemed never to have occurred to him that his labors were unusual, or that he needed a diminution of them by prolonged rests and change.

He asked at length if he ought to suspend those labors. It was not from weariness in or of his pastoral work. Neither was it because of its unfruitfulness. That was committed to Him who had said "I will be with you."

It is believed that much "fruit unto eternal life" was gathered under the commission given to the laborer.

But in time he became very deeply impressed with the importance of a change in the provisions for the education of those who were to be wives and mothers in our land, and workers also in the various Christian endeavors, and, therefore, charged with responsibilities demanding the *best* cultivation of the intellect and heart.

A train of circumstances, beginning in his sympathy with his beloved sisters, whose aspirations were denied, and his efforts in behalf of their education, reluctantly laid on their graves, continued in his own endeavors for self-education, prepared him for the close examination he made into the causes and the remedy for the admitted defects in the popular education of our young women.

With him to see what was needed to be done was to act accordingly. Obstacles only nerved to greater exertion.

It became quite clear to his mind that however great had been the good and the uses of seminaries for girls that rarely outlived their proprietors, the period had arrived when there should be superadded institutions having organic life, founded by public and private benefaction for the special training of young women, as had been done for that of young men, from the very infancy of our nation.

Up to the time that Mr. Sackett was deeply pondering the defects and the remedy, no attempts had been made in the direction of the needed radical change.

No moneys had in our State been laid by collective individuals or by legislative appropriation in the foundation stones of a college for women.

The nearest approach to it was made during that time of coming convictions, by Miss Lyon, in the building and furnishing of the Mt. Holyoke Seminary, in New England.

A subsequent visit to that school, and a study of its aims, by Mr. and Mrs. Sackett, showed them conclusively that a *multiplication* of such institutions, and the extension of the *entire* college system to them, was both needed and possible; and the immediate demand, therefore, of public welfare on any one willing to enlist the public for its attainment.

He reached the full belief that it was included in the unfolding of one of the divine plans for the promotion of interests in which human agency was employed.

He was conscious of the depth of interest and the power of determination that might be required of such an instrumentality, whatever else might be wanting in his fitness for it, and finally decided it to be his duty to attempt the work, and sustain it as best he could, unless some other better qualified person was so constrained.

He was convinced that in suspending his pulpit ministrations for such an object, for the few years it might require, he might, under God, be made an instrument of blessing thousands of families beyond the reach of his voice, and in many generations.

The results, as thirty years have already shown them, have demonstrated the correctness of his conclusions, though his hope of being able to return to his chosen calling was never realized; and though the ends he sought were wrought out under the law of good attained through suffering.

Now that the public sentiment has been educated on all the points involved in that pioneer project, and the public quite familiarized with the operation of colleges for women, it seems natural enough. The only wonder is that they had not long before received a full share in the millions given so freely for those furnished for young men from two centuries gone.

Not so when Mr. Sackett pressed strange ideas. It was herculean work then. The ideal, as existing in his mind, grew in distinctness, and dominating influence over his convictions. But it was not expressed to any one excepting Mrs. Sackett, whose concurrence in its embodiment he relied upon.

When finally all doubts were removed, and the way clear for action, he conferred with friends in Albany, and with his former teacher, Rev. Dr. Beman of Troy, and Rev. Dr. Kirk of Boston.

They approved the design, and advised him to call together a few friends of education and propose to them the scheme, with the possible feasibility of the undertaking. Such a meeting was convened in the consistory-room of Second Dutch church of Albany in April, 1851. The number present was small, but the scheme as presented by Mr. Sackett was regarded with favor. All, with one exception, were willing to lend the influence of their names, and a degree of co-operation otherwise. At the suggestion of Mr. Sackett, a provisional committee was appointed, consisting of Rev. I. N. Wyckoff, D.D., chairman, B. P. Johnson, secretary, Amos Dean, LL. D., Rev. H. Mandeville, D. D., James Edwards and Luther Tucker, who accepted the appointment.

Mr. Sackett, though the sole originator of the enterprise and expecting to bear its expenses, as well as the main laboring oar, at least till a charter and legal organization should be effected, deemed it more expedient, and more agreeable to himself to act as the general agent under the provisional committee. This was acceded to, at a subsequent committee meeting, and he was so appointed. At another, a circular prepared by him containing an outline of the project, with an appeal to the public, was adopted and signed by the committee. To this was appended a note concurring "in the views expressed" and "commendatory of an enterprise so important"— with the names of William H. Seward, Washington Hunt, Sanford E. Church, Samuel S. Randall, W. L. Marcy, N. S. S. Beman and other eminent men.

With this, and only this, save the strong consciousness of the divine approval, and the confidence of the sympathizing committee, he entered bravely into the work. It was entirely new to him. He had never had an analogous line of labor; soliciting subscriptions for an object proposed by himself would have been peculiarly distasteful to one of his native modesty and would have been positively declined, but for the feeling of necessity and of interest absorbing all other considerations. He wished no rewards except those "laid up" for faithful service. He had never been, nor wished to be a teacher, nor to hold any inside or permanent relation to the institution whose claims upon the public favor he advocated. Yet he anticipated and shrank from such opposing suspicions, not from toils or legitimate hindrances.

The plan as outlined embraced in detail:

First. The erection of buildings on ample grounds, full equipment in furniture, apparatus, library, etc., for at least one hundred boarding pupils, to whom the advantages were to be furnished at the actual cost of maintenance. All outlays having been supplied by gift for that purpose, no percentage on the investment of $50,000 — $100,000 would be taxed on the pupils.

Second. A charter giving full college powers; and incorporation of a self-perpetuating board of trust, selected from different localities, and the various Christian denominations, for avoidance of local control, and of sectarian relations — while yet possessing a decided religious influence and extended interest.

Third. A graded course of thoroughly practical and disciplinary study. It should be equal to those adopted by the best colleges for men, in point of discipline, but *superior*, through a better adaptation to a balanced development of the peculiar mental powers of women, and to a more perfect qualification for their divinely appointed place in the social economy.

Fourth. Distinct *special courses*, in a normal, a health and domestic department. The latter two of these were considered highly important to all who were to meet the grave responsibilities devolving upon those bearing the larger share in the conservation of the family, State and home comfort. The feature, somewhat pecu-

liar then, to the Mt. Holyoke Seminary, was not designed, as expressed in their statement, to avoid annoyance and expense in the employment of servants, but solely for its influence on the character and the health of those who might suffer in both from a continued position of inactive recipiency. The regular recurrence of duty in distributing for common comfort during the years of school life would help to fix the habits of kindly attentions to others that brighten *home* life. The instruction in household matters by a cultivated lady would make an impression of the dignity of useful labor.

Fifth. The appointment of responsible heads of the several departments of instruction, as a co-equal faculty of professors, fully competent by their unquestioned ability and experience.

Sixth. Endowments of the chairs of instruction and of scholarships.

Such was within the grasp of Mr. Sackett's hope to attain in one school; also the initiatory of a reform that would help to change the basis on which the schools for the higher education of young women should be placed, and in so doing do away with the great disparity in the provision for culture of the sexes. He did not, of course, believe that opening the existing colleges for co-education would be as effectual a method, or as this would in time demonstrate the propriety of an adaptation to a curriculum of studies to woman's peculiar and constitutional mentality.

This biographical paper may merely show the origin of this pioneer movement, its inception, and not fully the progress of the enterprise to its near attainment of completeness in its present state; nor show how other institutions resulted from the extended agitation of the questions pressed upon public attention in those six years, in which the Elmira College was struggling under discouraging difficulties for a healthful existence. That was its blessed mission, if nothing more were done, to open an easier way for them.

Suffice it to say of the work done in those years of its early history, that after securing a charter, which unfortunately had a clause naming Auburn for its location, and two years spent in raising funds for its attempted establishment there, the loss of the time and of more than $30,000 in pledged subscriptions in and out of Auburn befell the enterprise. Through inharmony of the local trustees with the general board, in reference to a site and control, it was found necessary to abandon Auburn.

By authority of the foreign trustees, Mr. Sackett, in his capacity as general agent and Secretary of the board, visited Elmira to ascertain its probable suitableness for the new location and to gain funds for it in whatever place the institution should maintain its existence and identity. In a letter written from there he reported himself favorably impressed by Elmira and said, "I called on Mr. S. Benjamin, and by an effort more earnest than would be justified, except in one who *knew* the importance of his object and was *bent* on success, I obtained a promise of $200." It is mentioned to show how

men in particular, and people in general, become receptive in the growth of ideas by their agitation. Mr. Benjamin, as he studied the value of the enterprise, after it came nearer, nobly gave to its prosecution and endowment many thousands.

At a later visit Mr. Sackett raised the question of a transfer to Elmira. Encouragement was given that the citizens would raise from $30,000 to $40,000 for the grounds and buildings. One gentleman, Hon. A. S. Diven, said he would give $5,000. A favorable decision was reached, and by order of trustees the change to Elmira was made in 1853.

The painful circumstances making it necessary to sustain the losses and the resulting conflicts over the charter gave Mr. Sackett at the time great solicitude, and at the point of decision, two weeks of almost utter sleeplessness. Yet his confidence in God was unshaken.

It became necessary to apply to the Regents for a new provisional charter, which was given, that the work might proceed in undisputed legality.

The buildings were raised in a time of great financial troubles; the charter was amended and the institution opened under it as "*The Elmira Female College*," in October, 1855, with 150 boarding pupils.

The plan of the building was that of the Greek cross, with an octagon center sixty feet in diameter. This was preferred by Mr. Sackett after much study as best combining the elements of use and beauty. Two of the wings were built, and though compelled to stop short of completeness, it was a beautiful edifice and enabled the trustees to furnish a good commencement in the educational part of the work while girding anew for the more to be attained.

Thus far Mr. Sackett's ideal was a realization. It was an *infant* institution, but the child of many prayers and strong hope.

No other, however interested, could fully enter into his joy.

No one who has not borne the burdens of a new move of such character, requiring a widely roused co-operation, could appreciate the ceaseless care by day; the sleepless night watches endured on account of friends and of foes; the soliciting of means by the pen, the press and visits innumerable; the thoughtful planning and the trying efforts for agreement in the execution of the plans. The hopes, the fears, the disappointments and the success must be experienced to be known. *Hic labor, hoc opus est.*

Mr. Sackett's active relation to the work ceased in 1857. Yet his solicitous regard to its welfare remained while he remained here to pray for it.

He rests from his labors at last, and his works do follow him.

In a letter written to a friend respecting his inability to resume ministerial duties, he says, pathetically, "But the Elmira enterprise was an exhausting labor. I have been weary since those labors commenced. There is no 'tired nature's sweet restorer' but death. I shall not be rested until nature is renewed in another life. Yet it was a work of faith throughout; undertaken without doubt as to

the divine will; and sustained through all its years of toil and trial without a question as to the results."

The remarkable equilibrium of his physical powers was broken, still his mind retained much of its vigor.

In mental character he was logical. He loved still to trace out clearly the line of distinction (often obscured) between the true and the false in philosophy, theology and morals, and to apply the laws of truth, thus brought to the understanding, kindly but forcibly to the beliefs and conduct of men. He was, therefore, a continuous student, also a quiet advocate of righteousness in all the ways open to him, as his strength permitted.

His sincere interest in education was never abated. He rejoiced, as only a few could, over the effectual pressure of right ideas upon wealthy and public spirited men and women, so that abundant facilities for a thorough and christian education in other colleges for women were supplied by their munificent gifts.

It had been in his hope; he lived to see it realized, and blessed God that so rich sequences in his graciously developed designs had so soon been manifested.

Of his private character it may be said, in the language of the inspired poet, "Blessed is the man that trusteth in the Lord, and whose hope the Lord is."

Faith and love were ever manifest in his daily life. His nearest friend could say, that in all the forty years in which they together passed through the anxious cares and trying toils of public service, his habitual meekness was never so disturbed that he uttered grievous words in his family, or ceased to act in kindly ways, however tried.

Another, who knew him well, said, "The rare combination of tenderness, gentleness, and sympathy with a calm hidden strength, made those who came to know Mr. Sackett love and admire him."

He was felicitously constituted, and divine grace confirmed all natural good qualities.

He was called to the more glorious service of the better state, on the closing day of 1879.

CLOSE OF THE CONVOCATION.

Dr. N. T. CLARK, Canandaigua — We have come to the end of the entire convocation. It seems to me that it has been a red letter occasion. I have been conversant with this association — the convocation — from its birth. I was present at its birth. I have been present at every session it has held since. I propose to attend it as long as I have strength to attend any educational body. I remember the time and the condition of things when this convocation was organized and the great gulf which then existed between secondary schools and colleges, and the secondary schools particularly, and the Regents. I have been asked since this organization if I had ever seen a Regent? I have. In the history of this association this great expanse has been bridged over. The teachers of secondary schools and colleges have all come together and have known each other; they have come here and have known the Regents personally and have found them very respectable men. We have been very much benefited by our association with them. I feel, therefore, that I wish to offer this resolution. I believe it will find a response in every heart here. (See proceedings, page 44.)

Dr. B. N. MARTIN — I beg leave to express my entire concurrence in that resolution and briefly to add the expression of my very deep personal gratitude for the particular opportunities that have been involved, if for no other, in the establishment of this convocation. I owe to these gatherings all the acquaintance that I have with the work of secondary education in our State. I meet here from all parts of our State principals of academies and I have derived great gratification from forming their acquaintance and learning their methods and the character of their institutions. Very much, also, of the acquaintance and interest I have in the different college institutions throughout the State is due to the free and delightful intercourse which it has here been my privilege to hold with the professors of the different colleges in the State. I have never attended a meeting of this convocation in which I have not felt a newly-awakened stimulus — a rebuke to indolence and an encouragement to exertion. I confess freely and gratefully the great value to me of the suggestions offered from time to time in this place; for they have contained many of the most suggestive criticisms and illustrations of edcational effort and of educational progress. I value, also, personally the opportunities and advantages which this institution has given and I feel the deepest gratitude to the Regents, and especially

to the gentlemen I here see before me at present — the Chancellor and the Secretary of the Board — for their assiduous and most timely labors in this department.

Chancellor PIERSON — Before pronouncing the Convocation adjourned *sine die*, you will permit me, perhaps, to conclude my opening address. It is not unusual to have the commencement of college life at the end, and I can probably speak better after having been stimulated as I have been stimulated by this convocation. There are some difficulties in executing satisfactorily the work of the convocation. In the first place the time is brief, and it comes in a part of the year when it is hard to get men and women together. In the next place the subjects are full of interest, and it is difficult to crowd so many within the brief time, and yet allot to each what we all want to hear from each. This convocation is a great pleasure to me. It is not a consultation, it is a grand congress. We certainly have never had so many in session as this year. I find by looking over the records that we have here the representatives of twelve colleges, two representatives from our sister States, standing at the head of their institutions; we have also represented here twenty-one academies, five high schools, thirty-eight union schools and three normal schools; our register shows over one hundred and thirty members in attendance. I know you have attended here patiently, constantly and devotedly.

And furthermore I wish to state another feature of the convocation which has given me very great pleasure, and that is the frankness, and unconstrained readiness with which each man has pronounced his opinion. We take no votes but we listen to all the teachers wish to say, and we have the advantage in the free discussion of each question; the very advantage which we seek, and from which the Board of Regents gets the stimulus, that carries it through the year and renders its work efficient. By that kind of free discussion and intimate association with you we get precisely what we want, and seek to learn your wants and our duty. In other words as Regents of the University, we learn the wants of education in this great Commonwealth, we become part and parcel not only of college education but of intermediate education and the public schools. I thank you heartily not only for your attendance but also for the interest you have shown and the pleasure you have thus given us. We trust we may see you again, not only next year, but year after year, because we seek by patient but persistent work to so build that those who come after us shall continue the superstructure for all time upon the foundation we have laid.

REPORT OF THE COMMITTEE ON ACADEMIC EXAMINATIONS.

The committee to whom, after the discussion of July 11, 1883, in the University Convocation, the subject of the Regents' examinations, was referred, held a meeting on July 12, at the office of the Regents. There were present Professor W. D. Wilson, chairman; Principal Bradley, Principal Sawyer, Principal Cutting and Principal Farr. Secretary Murray was also present for conference. The subjects discussed related to changes in the system of academic examinations, as suggested by the paper read by Principal Sawyer and by the discussion following it in the convocation. The following is a summary of the conclusions arrived at, which the committee resolved to recommend to the Regents for incorporation in the system:

1. The addition of higher algebra and solid geometry to the list of optional studies in group II, the examinations in elementary algebra and plane geometry to be continued as obligatory, and to be made so far less exacting as may be done without reducing them below the standard required for entering college.

2. Permission to be given in the academic course to substitute Greek subjects for English on the same terms as Latin subjects are now substituted.

3. The examination papers in Cæsar to be mainly elementary, leaving the more difficult topics of a classical examination to be included in more advanced papers on Cicero and Virgil. Also the insertion in the latter two papers, by way of *extras*, of easy passages selected from the authors, not previously read by the student, to be translated *at sight;* the rendering not to be as severely judged as in the case of required passages; the student to have the option of translating such passages or not; and in case he translates them extra credits to be allowed, which may be counted as making up deficiencies in the rest of the paper, the object being the encouragement of reading at sight as a class exercise.

4. In the examination on rhetoric and English composition the question-papers to call for, not so much a knowledge of formal rhetoric, as a familiarity with the rhetorical forms and usages which are necessary in good English composition, and an ability to write the English language clearly, correctly and fluently. (See syllabus, p. 58.)

5. In regard to the examinations in history, care to be taken to keep the questions within the broad lines of larger actions, with their important results; special facts in nowise to be excluded, but such as are in their nature minute, isolated and trivial not to be insisted on.

6. The limitation to three years of the time within which a candidate must pass in some additional study, or lose his place upon the records, having been found inconvenient, the limit to be so extended as to avoid doing injustice to actual candidates.

7. In general, no change in the present standard required for passing the examinations to be recommended; but such modifications and ameliorations to be made in the character and grade of the questions, as may give relief where the demand has seemed to be beyond the capacity of the average academic student; nothing to be introduced by way of change, which will detract from the value of the examinations as a test of liberal scholarship and an incentive to patient and continuous study.

Respectfully submitted to the University Convocation and communicated to the Board of Regents for its information.

ALBANY, *September* 1, 1883.

W. D. WILSON,
JOHN E. BRADLEY,
G. C. SAWYER,
G. R. CUTTING,
D. C. FARR.

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